



Borough of Southend-on-Sea.

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# ANNUAL REPORT

ON THE

HEALTH OF THE BOROUGH OF SOUTHEND-ON-SEA

FOR THE YEAR 1902,

BY

J. T. C. NASH, M.D., M.S., D.P.H., ETC.,

MEDICAL OFFICER OF HEALTH FOR THE BOROUGH

AND

MEDICAL SUPERINTENDENT OF THE BOROUGH SANATORIUM.

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Southend-on-Sea :

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## TO THE HEALTH COMMITTEE.

MR. CHAIRMAN AND GENTLEMEN,

The past year has been one both of anxiety and encouragement. The administration of the new Factory and Workshops Act, the outbreak at different times of small-pox, typhoid fever, and diphtheria in the Borough, in addition to the ordinary routine duties connected with the Health Department, involved a large amount of extra work for all the officials of the department, as well as for the matron and nursing staff at the Hospital.

I am glad of this opportunity of acknowledging the loyal support I received from my subordinates, both at the Health Department and the Sanatorium. At the Small-pox Hospital, Nurse Wilson was in charge during the whole  $7\frac{1}{2}$  months it was occupied, and carried out her trying duties in an admirable manner.

In June and July last an outbreak of typhoid fever of unusual proportions for the time of year required close investigation, as a result of which the majority of the cases were clearly traceable to the consumption of infected cockles from the Leigh layings. I collected a large amount of telling evidence, which I was able to connect, link by link, until no reasonable mind could doubt the causal relationship of the cockles from Leigh: but the strongest corroboration came later, when outbreaks of typhoid fever in various districts in London were independently traced to cockles derived from the very beds denounced by myself so long ago as June, 1902.

In August there was an unusual amount of diphtheria prevalent. Special reports on these various outbreaks have already been made, and further comments are embodied in this report.

In accordance with the provisions of the Factory and Workshops Act of 1901, fuller details are given in the present report as to workshops and workplaces than in any previous annual report.

Chickenpox was a notifiable disease under the Infectious Diseases (Notification) Act throughout the year, and the large number of notifications involved a great deal of extra work. The importance, however, of having made chickenpox a notifiable disease was instanced in that three cases so notified were found to be really cases of small-pox, and preventive measures were thus taken in time to prevent the spread of the more serious disease.

The facts and features of encouragement are as follows :—

The general death rate and infantile mortality are the lowest ever recorded since Southend-on-Sea became a borough. The zymotic death rate for 1902 compares very favourably with that for 1901. The increase of notifications of infectious diseases is, to a certain extent, more apparent than real, partly owing to increased accuracy of diagnosis through the help afforded by bacteriological methods at the Borough Laboratory.

The amount of work I have carried out in the laboratory will naturally arrest attention. Apart from 20 analyses of water, I made no less than 825 bacteriological examinations in connection with infectious diseases, as compared with 272 in 1901. An increasing share of my time will have to be devoted to this important branch of preventive medicine.

Two additional temporary inspectors, who were appointed in November last to continue the house to house inspection, instituted by this Committee in 1897, have carried out a large amount of useful work since they entered on their duties.

I beg gratefully to acknowledge the courteous attention and consideration given to any advice or recommendation I may have found it my duty to bring before your Committee. I am sure the committee will not consider it invidious if I venture to more particularly refer to the chairman, who shared with me the anxieties of the year, and whose practical knowledge and experience were of much help, specially during the erection of the new blocks, both at the Small-pox Hospital and the Sanatorium.

The interest taken by every member of the Committee in all matters appertaining to the improvement of the sanitary conditions of the borough encourage me to give very careful consideration to every matter I have the honour to report upon or lay before the Committee.

I am, Mr. Chairman and Gentlemen,

Your obedient servant,

J. T. C. NASH.

*Medical Officer of Health,*



# BOROUGH OF SOUTHEND-ON-SEA.

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## Health Committee :

MR. COUNCILLOR ALLEN (Chairman)  
THE MAYOR (Mr. Councillor Martin, J.P.)  
MR. COUNCILLOR BRADLEY  
" " CHIGNELL  
" " DOODY  
" " HILL  
" " HOBBS  
" " LOURY  
" " ROBERTSON  
" " NEWITT

## Town Clerk :

MR. W. H. SNOW

## Deputy Town Clerk :

MR. JUBB

## Borough Engineer :

MR. E. J. ELFORD, C.E.

## Honorary Consulting Medical Officer of Health :

MR. A. CLOUGH WATERS, M.B., B.S., J.P.

## Matron of Sanatorium :

MISS THOMPSON

## Officials of Health Department :

<i>Chief Inspector of Nuisances</i>	W. WHUR, A.S.I.
<i>Assistant</i> „	A. W. PENN, A.S.I.
<i>Assistant</i> „	F. W. MAYNARD
<i>Temporary</i> „	A. PEVERITT and J. L. SEDEN
<i>Clerk</i> - - - -	F. T. WEBBER

## Medical Officer of Health :

J. T. C. NASH, M.D., M.S., D.P.H.

## BOROUGH OF SOUTHEND-ON-SEA.

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SITUATION—Latitude  $51^{\circ} 32'$  to  $51^{\circ} 34'$   
 East Longitude  $3^{\circ} 39'$  to  $3^{\circ} 45'$

ELEVATION—Varies from sea level to 125 feet above ordnance datum.

SOIL—The surface formation is variable, consisting chiefly of brick earth, river gravel, and London clay.

### STATISTICAL SUMMARY.

Acreage	...	...	...	5,172
Census population, April, 1901	...	...	...	28,857
Population estimated to the middle of 1902	...	...	...	31,892
Average number of persons per house	...	...	...	5·3
Density of population per acre, 1902	...	...	...	6·16
Births	{	Males ... 420 Females ... 419	} Total ...	839
Annual rate of Births per 1000 inhabitants	...	...	...	26·30
Total Deaths	{	Residents within the Borough 418 ,, outside ,, 28 Visitors dying in public institutions 21	}	467
Nett deaths after deducting visitors	...	...	...	446
Nett annual rate of mortality per 1000	...	...	...	13·98
Excess of registered births over deaths of residents				
within the Borough	...	...	...	421
Infantile mortality	...	...	...	100·11
Rainfall for the year 1902	...	...	...	18·51 inches
Rain fell on	...	...	...	134 days
The greatest rainfall month was May	...	...	...	2·72 inches
The greatest rainfall in 24 hours was on June 13th,				
viz.	...	...	...	·61 inches
The least rainfall month was April	...	...	...	·27 inches
The month with fewest wet days was January	...	...	...	7 days
,, most ,, May	...	...	...	24 days
Average annual rainfall for 1891-1900	...	...	...	20·43
,, ,, previous 11 years (1891-1901)	...	...	...	19·91
Average number of days of rain per annum for period				
1891-1901	...	...	...	137

## Vital Statistics.

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For the vital statistics of the Borough during 1902 and for ten previous years, see Table I. appended.

### Population.

The mid-year population of the Borough during 1902, and for ten previous years, are given in tabular form (Table I.) appended.

The mid-year population of the Borough of Southend-on-Sea for 1902 is logarithimically estimated at 31,892. These figures are in fairly close accord with the estimated population by enumeration of inhabited houses and allowing 5.3 persons to each house. This latter method of estimation has been in vogue since 1894. It was adopted on account of the rapid growth of the Borough. During 1902 697 houses were passed by the Borough Surveyor's Department, as compared with 479 in 1901.

What is known as the *natural increase of population* by the excess of births over deaths during the year amounts to 421.

### Acreage and Density of Population.

The area of the Borough being 5,172 acres, the density of population for 1902 was 6.16 persons per acre, as compared with 5.69 persons per acre in 1901, 5.35 in 1900, 4.77 in 1899, and 4.36 in 1898. In 1897 the density was 5.60 per acre before the incorporation of Southchurch.

### Births.

The total number of births registered in the Borough in the year 1901 was 839. Of these 420 were males and 419 females. This is equivalent to a *birth rate* of 26.30 per 1,000 inhabitants. 21 births were of illegitimate children, 11 boys and 10 girls, forming 2.50 per cent. of the total number of births.



Table I. appended gives various statistics, including the number of births and the birth rate for each year since 1892 as well as the average for the ten years, 1892-1901.

Though the total number of births is, as a matter of course, increasing *parri passu* with the growth of the Borough, the *birth rate* tends to decline, being 26.30 per 1,000 population, as compared with an average of 27.06 for the years 1892-1901.

The birth rate for England and Wales during 1902 was 28.6.

## Deaths.

The total number of deaths registered in the Borough during 1902 was 439. Without correction this would give a death rate of 13.76. Until 1901 the *nett death rate* was obtained by eliminating the deaths of all known to be visitors, and adding the deaths of Southend residents registered at the Rochford Union Workhouse. The new forms of Tables issued by the Local Government Board, *only permit the elimination of non residents when the deaths occur in public institutions*. Of the deaths registered in the Borough, at least 36 occurred among visitors, but only 22 of these occurred in public institutions. In the table after deducting the deaths of non-residents, which occurred in public institutions, to the resultant has been added 28 deaths of residents who died in the Rochford Union Workhouse. Giving a nett death rate of 13.98, as compared with a nett death rate of 17.02 in 1901. If, however, as in previous years the deaths of all known non-residents be eliminated, and the deaths of residents registered outside the Borough be included, the nett number of deaths during the year would be 437, and the nett death rate 13.51. These latter are the figures for comparison with previous years, 15.97 in 1901, 14.44 in 1900, 15.54 in 1899.

It will be seen on reference to Table I. that the total and nett deaths, and death rates for each year since 1892 and the average for the decennium 1892-1901 are given. Below will be found a table comparing the average death rate for Southend with the death rates for England and Wales, 76 great towns, and 103 smaller towns :—



The death rate for England & Wales during 1902 was	16.3
„ „ for 76 great towns ...	17.4
„ „ for 103 smaller towns ...	15.3
„ „ for Southend, according to Table I. ...	13.98
The death rate for Southend, old methods of estimation	
by excluding <i>all</i> visitors deaths ...	13.51

107 deaths, or 24.3 per cent of the total number of deaths registered in the Borough during the past year were among persons upwards of 65 years of age, while 85 or 19.3 per cent of the total were under 1 year of age. The number of uncertified deaths during the year was 24, compared with 22 in 1901, 27 in 1900, 12 in 1899, and 8 in 1898.

## Infantile Mortality.

In my last Annual Report I commented on the high rate of infantile mortality of the two preceding years. I showed that but for the prevalence of measles and whooping cough in the earlier part of 1901, the rate for that year would have compared more favourably than it actually did with 1899 and 1900.

I commented on the favourable decrease during 1901 of deaths due to diarrhoea and digestive disorders among infants. Finally I concluded with the promise that further means of reducing infantile mortality in Southend would be considered by me during 1902. I will first state the figures for 1902 for comparison with previous years, and then will make some further comments.

The number of deaths of children under 1 year during 1902 was 84 (including one visitor) as against 839 births in the registration district during the year. The infantile mortality is the proportion borne by the deaths occurring among infants under 1 year of age per 1,000 births. This works out at 100.11 for 1902, as compared with 179.25 in 1901, 182.40 in 1900, 184.17 in 1899, and 170.81 in 1898, or as compared with an average of 179.15 since the population of Southend exceeded 20,000 persons. One death due to wilful murder might be legitimately excluded, which would make the infantile mortality fall below 100 per 1,000 births.

This is a remarkable and noteworthy reduction from an excessive mortality among infants to a figure which will compare favourably with that of any town of similar size. The following table is of interest in this connection.

Infantile Mortality for England and Wales, 1902	...	133
„ „ 33 great towns - „	...	145
„ „ 103 smaller towns „	..	135
„ „ Southend-on-Sea „	...	100

The following table is drawn up to make a comparison between Southend-on-Sea and other Urban Districts, and England and Wales as a whole, for 1902 :—

	Birth Rate.	General Death Rate.	Zymotic Death Rate. 7 Diseases.	Infantile Mortality.	
				A	B
England & Wales	28·6	16·3	1·64	133	
76 Great Towns ...	30·0	17·4	2·12	145	
103 Smaller Towns	27·3	15·3	1·53	135	
Southend-on-Sea ...	26·3	13·98	1·91	100	19

A. Annual Death-Rate of infants under one year per 1,000 births.

B. Percentage of deaths under one year to total number of deaths.

What is the explanation of this great reduction of from 40 to 50 per cent. in the infantile mortality as compared with 1901, or in other words this saving of about eight additional lives among every 100 infants born during 1902, as compared with immediately previous years? The total saving in infant life (under 1 year of age) during 1902, as compared with three immediately preceding years, amounted to about 67 persons during the year.

It is an inspiring thing to save life, if it be but one a year. To find that 67 infants lives have been saved during 1902, as compared with the three years previous, is most encouraging. It is our duty and pleasure to seek for the explanations of this reduction, and

having unravelled as many as possible to endeavour in the future to work on these life-saving lines, and diligently contemplate fresh ones. It is the earnest endeavour of all Sanitary Authorities, understanding their duties, to save life in every direction, realising that the most valuable asset possessed by State or Municipality is human life. For this reason Medical Officers of Health are appointed to administer and advise in all matters connected with the health of a district. In Essex generally, and particularly in the S.W. portion of the county, infantile mortality is very high, as pointed out by Dr. Thresh, the County Medical Officer, at a meeting, which he convened to discuss the causes of excessive mortality among infants. This conference was held at Leytonstone on November 12th, 1902.

Various factors have been held accountable for this high infantile mortality in Essex, and no doubt these all contribute in some measure, such as improper artificial feeding with so-called infants' foods; long tube bottles; overcrowding; drunken and immoral parents; insanitary conditions; etc.; but unquestionably, the most important factor is, as a rule, the *season of the year*, infantile mortality going up by leaps and bounds from June onwards, to an excessive height in July and August, slowly declining in September, falling considerably in October, and more gradually in November, to a minimum during the winter months (unless such other zymotic diseases as whooping cough and measles happen to be prevalent). In studying infantile mortality, the prevalence of epidemic disease, must, of course, be well considered, but to a certain degree discounted as unduly influencing and disturbing what might be termed the normal infantile mortality of a district.

I drew attention at Leytonstone to the influence of *insanitary conditions*, and more particularly of imperfect methods of disposal of organic refuse in the neighbourhood of large towns, as one of the principal causes of infantile mortality, especially during the summer and autumn months of the year. It is thus seen that I attribute a great deal of excessive infantile mortality to two factors—*season and imperfect sanitation*. But I want to make it clear that I consider these to be *indirect* factors, and the underlying *real* factors must be more closely sought for. At Leytonstone on November 12th, 1902, I suggested that the common housefly and bluebottle fly were largely



dependent both on season and organic filth for their existence, and on the latter for their *raison d'être*, and that they carried noxious filth to milk and other foods, etc. In a discussion on an important paper read before the Epidemiological Society of London by Professor Delifine, of Manchester, on "The Bearing of Outbreaks of Food Poisoning upon the Etiology of Epidemic Diarrhœa," I further elaborated this hypothesis, grounding it upon my experience in Southend during 1901 and 1902\*.

## Diarrhœa.

Whereas, there occurred in Southend during July and August, 1901, no less than 23 deaths from diarrhœa among infants under 1 year of age. There was no fatality from this cause during the corresponding months in 1902. Now, this is a very remarkable fact. The 4-foot earth temperature had reached and exceeded 56° F (Ballard's critical temperature) since June, yet there was no diarrhœa. Rain fell on 22 out of the 62 days in July and August, and the months were cool. Dr. Newsholme has pointed out the influence of wet seasons on diarrhœa, but here again I think the seasonal influence is merely *indirect*. The most remarkable phenomenon to my mind during June, July, and August, 1902, was *the almost complete absence of flies*.

Now, I must draw attention to a further noteworthy coincidence. In September, 1902, the housefly was in evidence for about three weeks, and during this time 13 infant deaths from diarrhœa were recorded. Then the fly suddenly disappeared, and with it also disappeared the sudden outbreak of diarrhœa. The coincidence is striking. Is there a causal connection? I think so. In Southend the provision of a refuse destructor is yet in abeyance. Our refuse is dumped down in the Sutton Road at the brickfields for brick-making. I have occasionally found that some of it is surreptitiously dumped down on any waste fields in the vicinity of houses more centrally placed. Flies are attracted and breed freely in these collections of organic filth. Then with bodies thickly covered with all sorts of noxious bacteria they fly into neighbouring houses, fall into the milk, or settle on other food, especially on opened tins of condensed

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\* Trans. Epidem. Soc. Lond. also "Lancet," January 31st, 1903, and "The Hospital," January 31st and February 7th, 1903.



milk got ready for the baby, or on the sugar, or on the lips of the poor sleeping infant itself. In this way food, even if previously boiled, may become contaminated with hurtful germs, or the germs may be directly transplanted on the mouth. The temperature at the time of year (summer and autumn) is conducive to rapid bacterial growth. In milk bacteria find an ideal pabulum and multiply at a most rapid rate, so that milk exposed for a few hours will be found to contain millions of bacteria per cubic inch.

In 1900 Dr. Waters published a pamphlet on "The Feeding and Care of Infants," which contained some simple rules as to the feeding of children during the first 18 months, together with a few hints as to clothing, fresh air, sleep, eyesight, and improper foods. This was useful in its way, but, as a bacteriologist, I felt that it was necessary to supplement these rules by a further series of rules, which would teach parents the importance of *cleanliness* of all utensils used for food, instruct them in methods of cleaning, so as to avoid dust; in methods of treating milk so as to kill all vegetative forms of bacteria without spoiling the taste or nutritive qualities of the milk, &c. I have recently added what I consider a most important precaution, especially in the summer when dust and flies abound. This is rule IX., which shows the importance of covering over all foods, *including tins of condensed milk*, so as to keep out all dust and flies. The "Simple Rules for Preventing many Infants' Complaints" were printed by order of the Health Committee, and freely distributed in the Borough in June and the following months. Copies were also sent to the Registrar of Births with the request that he would hand a copy to parents on the registration of each birth. The following is a copy of the pamphlet:—

## DEATHS AMONG INFANTS.

### HOW CAN THESE BE REDUCED,

HEALTH DEPARTMENT,

SOUTHEND-ON-SEA,

May 26th, 1902.

During the last few years the number of deaths among infants in Southend-on-Sea has been truly appalling. A large proportion of

these deaths is preventable. If the following precautions are observed a large number of infants lives will undoubtedly be saved each year. During the last three years an average of eighteen babies out of every hundred born in the Borough have died before reaching the age of twelve months. Strict observance of the following rules and precautions will probably reduce the high death rate, and save many innocent lives:—

I.—Infants thrive best in clean, well-aired, and dust-free dwellings. Therefore, keep your house and children thoroughly *clean*.

N.B.—Dry dusting and sweeping are not wholesome methods of cleaning, as the dust (which is full of germs) gets into the air, and settles again on articles of food, furniture, &c., besides getting down the throat and nose. *Lightly rubbing over furniture with a damp cloth and washing and scrubbing of floors, &c., are the best methods of cleaning.*

[Read carefully the accompanying Pamphlet of “Household Hints,”] (These were printed in my Annual Report for 1901).

II.—Report to the Health Department, Clarence Road, any smells or choked drains about your premises or street.

III.—*Burn* at once all animal and vegetable refuse, such as fish-heads and tails, unused vegetables, &c. *Never place these in the Dust Bin, nor leave them long about in the Kitchen or Scullery.*

IV.—If possible feed your infant at the breast, and on no account wean an infant during the hot weather. It is very dangerous to wean an infant between July and September.

V.—If it is absolutely necessary to feed a young infant by hand carefully observe rules 6, 7, 8 and 9, on page 1 of “Household Hints.” Milk should only be put into *Absolutely Clean Covered jugs* or other utensils.

N.B.—Mothers' breast milk is of course the best and only food for young infants if obtainable.

In addition, observe the following rules for the feeding of infants:—

- (1) Take in fresh milk twice a day.
- (2) Directly the milk arrives place it in a small clean saucepan, which has been scalded out with boiling water, and place this in a large saucepan of water, which should then be made to boil for about twenty minutes. The milk should then be left covered over in the saucepan in a cool, clean place until required for use. In this way the milk can be kept sweet and free from dust and smells, which make it "go bad."

N.B.—If cow's milk is so treated it is the best substitute; but if in the hot weather it does not keep sweet, Nestlé's Swiss milk is a safe substitute for a short time, but as soon as possible return to fresh cow's milk.

- (3) The kind of feeding bottle used is very important.

N.B.—All feeding bottles with long india-rubber tubes are dangerous and often prove death traps. The best kind of feeding bottle is the Slipper or boat-shaped bottle, *without tubes*, having only a teat *which can be turned inside out* so as to allow of scrubbing it. Two bottles should be obtained and used alternately. The bottle not in use should be left lying in clean, cold water, having been previously scalded out directly after the previous meal.

- (4) No child under six months of age should ever be given "pap" or "bread crumbs," or "tops and bottoms," or rusks, or any kind of infants food whatever under any circumstances.

N.B.—Most so-called infants' foods are really poison to very young babies.



VI.—It is absolutely indispensable that a baby should have plenty of fresh air in the bedroom. This means that there should be *no overcrowding* of rooms, and that windows should be frequently opened.

N.B.—Among “Nuisances” liable to be dealt with summarily under Section 91 of the Public Health Act, 1875, is “Any house or part of a house so overcrowded as to be dangerous or injurious to the health of the inmates, whether or not members of the same family.”

VII.—Babies and young children should be *lightly but warmly* clad in garments which properly cover the legs, belly, chest and arms. Young children are very liable to contract bronchitis and diarrhœa if their limbs and bodies are not properly covered.

VIII.—A young baby should never be left in the charge of an incompetent person or young child.

IX.—It is important to keep all milk, whether ordinary, or boiled, or condensed, covered over so as to prevent flies settling. Flies come from dustbins or manure or refuse heaps laden with germs, which multiply in milk, &c., and are a fertile source of diarrhœa.

## DIET FOR HAND-FED INFANTS, ACCORDING TO AGE.

N.B.—Infants under six months should not be hand-fed if the mother can nurse them. If the mother has not sufficient milk, she should feed alternately with the breast and the bottle.

Infants aged 1-6 weeks	{	$1\frac{1}{2}$ tablespoonfuls milk (treated as directed in Rule 5 above). $2\frac{1}{2}$ tablespoonfuls boiling water. 1 teaspoonful of fresh cream. Every two hours at regular intervals,
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Infants aged 6-12 weeks { 4 tablespoonfuls milk (treated as above).  
4 tablespoonfuls boiling water.  
2 teaspoonfuls cream. Every three hours  
regularly.

Infants aged 3-6 months { 6 tablespoonfuls milk (treated as above).  
2 tablespoonfuls boiling water.  
2 or three teaspoonfuls cream. Every  
three and half hours regularly.

The addition of cream is necessary to make cow's milk as rich as mother's milk. If cream is not added, the child is not properly nourished, and "rickets" or "scurvy," etc., may come on.

When feeding an infant the child should be nursed and the bottle held in the hand, so that the baby cannot take the food too quickly; if the food is swallowed too quickly vomiting often follows, and the infant does not get the benefit of a full meal.

*Note.*—Freshly made barley water may be used instead of plain water, particularly if the milk does not seem to quite agree with the infant. If the milk still disagrees consult a doctor. If the doctor is asked to make an urgent call it is preferable to give nothing until he arrives except a little plain previously boiled water.

After the infant's teeth begin to appear, once or twice a day the milk should be thickened by the addition of thoroughly cooked whole meal flour or oatmeal.

After 12 months of age, the child may have stale bread crumbs and meat gravy, or an egg with bread crumbs, or a little rice pudding well cooked.

N.B.—No child under 5 years of age should ever be given cheese, or tarts, or beer. The principal articles of diet should still be milk, bread and butter, light puddings, an egg, or a little minced freshly cooked meat or fish (not ham, bacon, pork or veal).

J. T. C. NASH,  
*Medical Officer of Health.*

The infantile mortality is, by sanitarians, considered as a better index of the sanitary conditions of a district than the general death rate. Where, therefore, a high mortality is in evidence it is necessary to turn a critical eye upon our own sanitary methods and ask ourselves, where are we in fault? I unhesitatingly say that in my opinion our chief default is in our methods of refuse disposal. Up to a certain stage our methods are excellent. We have sanitary galvanised-iron dust bins with well fitting covers. We have frequent removals of refuse from our houses in decent covered dust vans. So far so good, but in the ultimate disposal of our refuse there is room for improvement. This matter requires the very earnest attention of the Council. I have frequently alluded to it, and further remarks will be found in this report under the heading "Disposal of Refuse." A critical person might here say "You ascribe the heavy infantile mortality of previous years in large measure to imperfect methods of refuse disposal. No better methods were in vogue during 1902, yet the infantile mortality fell to 100 from 179 in 1901. How can you reconcile these facts?"

My answer is this: (i) We took special pains to instruct mothers in the best methods of counteracting the baleful effects of imperfect methods of refuse disposal. (ii) Nature assisted us in 1902 in an almost unprecedented manner. The summer was showery, and the dust was frequently laid. Equally important, the meteorological conditions were unfavourable to the existence of flies, so much so that it was a matter of common comment: "How very few flies there are this summer." I have already alluded to the part played by flies in the production of disease. The following pathogenic bacteria among others have been bacteriologically isolated from flies *taken from refuse heaps* on the confines of a town. They form a formidable list. *Bacillus Coli*, *Proteus Vulgaris*, *bacillus enteriditis* (Gaertner), *Streptococcus Staphylococcus pyogenes aureus*, &c.

Seeing that flies from refuse heaps bear such inimical germs on their bodies to neighbouring dwellings, how important indeed it is (i) to cover over all foods to prevent the access of flies; (ii) to employ fly-catchers and other means of destroying flies; (iii) to make every effort to secure speedy and efficient destruction of refuse immediately following on our present excellent methods of collection of refuse.

During the coming year the summer may be dry, and dust and flies may abound. Pending the provision of a refuse destructor, the rules I have drawn up, and which have been printed and circulated by order of the Health Committee, will be our main line of defence if carried out conscientiously in our homes.

Apart from the favourable meteorological conditions, I think there is good reason for thinking that the publication and circulation of these pamphlets has been largely instrumental in effecting a noteworthy reduction in the mortality from digestive disorders and diarrhœa, and respiratory diseases, as recorded in the following table.

The Health Committee may, I think, have the satisfaction of knowing that the large reduction in the infantile mortality is at any rate in a considerable degree the result of their wise action in this matter.

The certified causes of deaths of infants under 1 year of age for 1902 and previous years are as follows :—

	1896	1897	1898	1899	1900	1901	1902
Digestive Diseases	11	32	27	30	37	10	6
Diarrhœa	18	12	20	24	15	27	5
Premature Births	17	16	15	20	30	21	21
Respiratory Diseases	12	13	8	18	17	22	10
Convulsions and							
Nervous Diseases	8	4	11	11	10	12	10
Atrophy	0	3	4	14	15	11	10
Tubercular Diseases	2	1	6	1	7	12	5
Measles	4	0	4	0	1	6	0
Whooping Cough	0	6	3	0	1	13	5
Scarlet Fever	0	0	1	0	0	0	0
Syphilis	0	0	1	0	0	0	1
Disease of Urinary Organs	0	0	1	0	0	0	0
Found Dead	0	0	1	0	0	0	1
Overlaying	1	1	0	1	2	0	0
Erysipelas	0	0	1	0	0	0	1
Diphtheria	1	0	0	0	0	1	0
Acute Peritonitis	0	0	0	1	0	0	0



	1896	1897	1898	1899	1900	1901	1902
Obstruction of Bowels	0	0	0	1	0	0	1
Malformations	0	0	0	0	0	1	1
Splenic Leucocythosis	0	0	0	0	0	0	1
Pemphigus	0	0	0	0	0	0	1
Cirrhosis of Liver	0	0	0	0	0	0	1
Influenza	0	0	0	0	0	0	1
Disorders of Parturition	0	0	0	0	0	1	2
Accidents	0	0	0	0	0	1	1
Septic Diseases	0	0	0	0	0	1	0
Want of attention at birth	0	0	0	0	0	1	0
Murder	0	0	0	0	0	0	1
	—	—	—	—	—	—	—
Totals	74	88	103	121	135	140	85

## Inquests.

During 1902 there were 28 inquests held. The verdicts being as follows :—

### 1. Natural Causes—

Phthisis	...	...	...	1
Heart Disease	...	...	...	1
Heart Failure (Syncope)	...	...	...	2
Apoplexy	...	...	...	1
Pneumonia	...	...	...	2
Aneurism	...	...	...	1
Obstruction of Bowels	...	...	...	2

### 2. Accidental—

Falls from a height	...	...	...	2
Fracture of Skull	...	...	...	1
Burn-Shock	...	...	...	1
Suffocation	...	...	...	1
Run over by a train	...	...	...	1
Run over by a tramcar	...	...	...	1
Drowning	...	...	...	1
Electrocution	..	...	...	1



## 3. Suicide—

By Hanging ...	...	...	...	2
By Drowning ...	...	...	...	2
By cutting his throat while of unsound mind ...	...	...	...	1

## 4. Open Verdict—

Found Dead on the Foreshore ...	...	...	...	3
Wilful Murder ...	...	...	...	1

## Uncertified Deaths—

Too many deaths remain uncertified. I think the holding of inquests on many more of these cases would be advantageous. The following is a case in point :—

I observed among the death returns one week an uncertified death from “ulcerated throat.” As this is an extremely improbable cause of death, my suspicions were that the death was really due to diphtheria. I visited the house, and found another child with symptoms suspicious of diphtheria, without, however, any membranous exudation visible. A swab culture from the throat revealed typical diphtheria bacilli, and corroborated my suspicions as to the real cause of the uncertified death being from diphtheria.

I wrote to the coroner drawing his attention to these facts.

The following figures show the number of deaths uncertified each year since 1895.

	1895	1896	1897	1898	1899	1900	1901	1902
Uncertified Deaths	10	7	8	16	12	27	22	24

**Disposal of Refuse.**

The question of a Refuse destructor has been before the Council now for some years. In my report for 1901 I stated what had been done in the matter up to January, 1902, when it was agreed to appoint a sub-committee to visit and inspect various well known types of destructors in actual use in other places.

On March 4th, 1902, the sub-committee reported that they had examined various types of destructors at Fulham, Streatham, Hornsey, Shoreditch, and Cambridge. The Borough Surveyor at the same time submitted a report, from which I make some quotations:—

Of all the methods that have been adopted for the disposal of Town Refuse, Cremation or Destruction by Fire seems to have been most generally favoured. In towns where the ash-pit is common and the contents possess some manurial value the local farmer uses a proportion, the remainder being stored to await sale, or, as often as not, is “dumped” into the nearest quarry, sand-pit, or even the valley of a convenient stream. The great objections to the latter cases are too apparent to be dwelt upon.

The alternatives to *Cremation* that present themselves in a town like Southend are:—(1) Disposal of Dust to Brickmakers. (2) The conveyance out to sea and deposit in deep water.

Either of these alternatives would require storage and accumulation for perhaps two or three days, and assuming that the dust would be sent out of the district, there is a strong probability that complaint would arise from this, also that outside districts might object to receive our refuse.

As is well known, the dust of this town is collected and delivered to (1) The Milton Hall Brick Co., where it is screened and burnt in a furnace, and (2) to Messrs. Utton’s Brickfield, where it is used for brickmaking.

At present the average daily yield of dust is about 30 loads, of which 25 loads go to the Milton Hall Brick Co. and 5 loads to Messrs. Utton’s Brickfield. This is house refuse, but besides this there is a considerable quantity of Shop or Trade refuse which is not collected by the Corporation, which would bring up the actual amount of Refuse to a much higher figure.

The existing arrangements for the disposal of the Town Refuse cannot be considered satisfactory. It is highly desirable that here, as in other places, Dust Disposal should be achieved without nuisance innocuously and perfectly. To do this, *Cremation* at a high and constant temperature is the only means to be adopted. Slow burning or “frizzling” produces a distillation of the various component parts of the mass, the empyreumatic odours given off being remarkably noticeable and offensive. Dust Destruction is now easily achieved by many of the perfected appliances without nuisance. Commercial gains result from the utilization of the heat for various purposes, and

the resulting vitrified clinker after Cremation is a valuable material for road formation, &c.

The present practice, generally speaking, is to a preference for a forced draught as against a natural draught. The first possesses the advantage of a great output—more than three to one as compared with a natural draught. Perfect combustion is obtained by the high temperature; a high chimney is not *necessary*, and a secondary furnace or fume cremator is not required. On the other hand, the life of a cell is not so long as with a natural draught, more maintenance being required. With a natural draught the output is small, a secondary furnace, or fume cremator is required (a costly luxury), a higher chimney is required, and of course more labour is required to work the furnaces.

Every advantage ought to be taken of the destructor to obtain the highest power from the refuse burnt there. It can be made a useful part of the Corporate Estate. It need not only be a furnace: to a certain extent it can be made a power generating station. It can be made to serve two purposes:—(1) To destroy dust and town refuse. (2) To raise steam for electric lighting or mechanical power.

The first question that presents itself is, where is the site for the Destructor Dépôt? I think the London Road site is very suitable.

I may remark that no fears of a nuisance need be entertained from the proximity of a Refuse Destructor, as perfect combustion can be obtained without smell of any kind.

The existing chimney can be utilized, which will represent a considerable saving in outlay.

As a result the Health Committee recommended that tenders be invited for the erection and construction at the Dépôt at the rear of London Road, of a modern destructor, but certain legal complications re the site, induced the town Council to refer the matter back. Since then I have repeatedly urged the importance of providing a Refuse Destructor as speedily as possible in the best interests of the Borough. I am inclined to attribute the tendency to a high rate of infantile and zymotic disease in some measure to our present insufficient methods of refuse disposal. It is my well considered and often expressed opinion that the provision of a refuse destructor should take precedence of almost any other sanitary reform. A large part of the town's refuse is at present carted to, and deposited in the brickfields in Sutton road, or occasionally street sweepings are deposited in



hollows in more central situations. In either case the deposit, which is nothing more or less than "dry sewage," is made in the neighbourhood of rapidly growing districts. The refuse at the brickfields is hand-screened for brick-making. This is a degrading occupation in itself, and in dry weather means that the fine organic dust, which is liberated in this process is scattered far and wide. The organic matter in the refuse breeds bacteria and attracts flies. These same flies subsequently invade dwelling houses and contaminate every vessel and article of diet on which they settle, more particularly milk, especially in warm weather. Flies multiply rapidly in the late summer, and thus the risk of these insects carrying pestiferous germs to milk and other foods is greatly enhanced. The enormously rapid growth of bacteria in milk at a warm temperature is shown by the following figures as estimated by Professor Conn :—

At a temperature of		77° F	95° F
2 hours after milking			1,275,000
6	„ „	14,620,000	45,900,000
9	„ „	36,550,000	57,800,000
24	„ „	13,702,000,000	13,812,500,000
[Bacteria per cubic inch].			

These stupendous figures and staggering multiplication must appear to the uninitiated almost incredible, but I can vouch for their approximate truth. In view of these figures will be seen the necessity (1) for the advice given in the pamphlet "Important to Mothers," (*vide* p. 14-16) (2) for providing as expeditiously as possible a refuse destructor for the immediate incineration of all refuse, which otherwise breeds bacteria and germ bearing flies.

It is my settled conviction that the want of proper and speedy destruction of refuse is partly to blame for the continued prevalence of diphtheria, and very largely responsible for the high diarrhoea mortality, especially among infants in former years (see also remarks under Infantile mortality).

I am given to understand that if the Council will acquire by compulsory purchase, a strip of land adjoining the Dépôt, so as to

gain an entrance from the North Road, the sentimental objections at present raised to the use of the site in the London Road will be overcome. In the meantime the Borough Engineer and Surveyor has been instructed to prepare plans and specifications, and I hope that by the time the next annual report has to be written, I shall be able to record that the Town Council not only has agreed as to the refuse destructor, but that the work will be well in hand.

## Notifiable Zymotic Diseases.

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### Small-Pox.

At the beginning of 1902 there was one convalescent case isolated in the Borough Small-Pox Hospital. This case is referred to in my annual report for 1901. No further case was notified in January, but one, which was notified at the end of the month as chicken pox, was subsequently found to be small-pox. Fortunately this case had been treated as a doubtful one, and was strictly isolated, but his father, who was considered too ill to be vaccinated, unhappily contracted small-pox, and both were removed to the Small-pox Hospital. No further case in connection with these occurred. Early in February I was asked to see a female patient who presented suspicious symptoms. This was found to be another case of modified small-pox. From this case infection had been carried by *indirect* contact before notification to an unvaccinated child, whose parents refused vaccination when proffered ; but when this child fell ill with small-pox, after much argument, I prevailed on the objecting parent to allow vaccination of other members of the household, and I am happy to say no further case occurred from this source. The next case occurred in another part of the Borough, and was traceable to contact with a tramp. This case was not notified for about a week, and in the meantime infected an unvaccinated infant by direct contact, and an unvaccinated child aged 4 by indirect contact. This latter contact was not mentioned in spite of strict inquiries ; the parents disbelieved in vaccination, and the unfortunate child lost its life through a severe attack of unmodified confluent small-pox. The unvaccinated infant, which had been in direct contact, was vaccinated within an hour of the receipt of notification, and happily escaped with a mild attack, though not vaccinated until the eighth day after exposure to infection. Eight cases which occurred in April concided with an incubation period dating from the influx of excursionists for the Easter holidays. All had been in contact with excursionists. Only



one secondary case occurred in the person of an unvaccinated child, aged 2, who had been exposed to infection for a week before medical aid was sought. The next case was imported by an unvaccinated youth, aged 18, who contracted malignant hæmorrhagic small-pox in an infected district in London; while an unvaccinated girl, aged 11, contracted a fatal attack of confluent small-pox, in all probability indirectly through her father having been employed in an infected district outside Southend.

Subsequent to this no further cases occurred until the end of May, when an unvaccinated man who had been in contact with Whit-suntide excursionists was found to be suffering from the disease. Another man, aged 35, not vaccinated since infancy, was notified early in June. He also had been in contact with Whit-Monday excursionists. All other persons in the house were inoculated with satisfactory lymph, and all reacted well with the exception of a woman, aged 56, who could not be vaccinated, though two attempts were made. She subsequently failed with small-pox. The last case of all, outside the hospital, was imported from Rochester, but gave rise to no further cases. In the hospital a newly engaged wardsmaid, who brought a certificate of recent successful vaccination, failed with small-pox on the twelfth day after she entered on her duties, when a careful inquiry into the facts revealed that she had never been really vaccinated. This case is fully recorded in my special report. Altogether 24\* cases were removed to hospital from different parts of the Borough during the year. Three of these cases had been originally notified as cases of chicken pox. Two of these, after consultation, were re-notified as small-pox, while the third, though convalescent, was removed for a short time as a safe-guard and to facilitate disinfection of the infected premises. In addition, one written, and one verbal notification of small-pox were made, but after consultation the facts were revised, and the cases re-notified as chicken pox. The wisdom of having made chicken pox a notifiable disease during the prevalence of small-pox is amply shown by the above facts. In about twelve per cent. of the cases which occurred, we were thus enabled to deal effectively with them at an *early* period through chicken pox being a notifiable disease under the Notification Act.

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\* One of these proved to be not Small-pox.

## Vaccination.

I have very fully dealt with this most important preventive measure in my special report, which was placed in the hands of the Town Council a few months ago. As there are some who think the method which has been attempted at Leicester in dealing with outbreaks of small-pox efficient, I emphasise here a few paragraphs from my special report. (See special report, page 16 and first paragraph p. 17). These paragraphs indicate how prompt notification and isolation cannot be depended upon in every case. The recent experience of Leicester at the beginning of 1903, when small-pox began to spread very rapidly, until the medical Officer of Health hunted up and vaccinated all contacts, is a further testimony to the inefficacy of trusting only to notification, isolation, and disinfection, apart from vaccination, to speedily stamp out small-pox. Our experience with other infectious diseases clearly shows that, though the important measures of notification, isolation, and disinfection enable us to control and limit the spread of infectious diseases, they do not enable us to *eradicate* them altogether. On the other hand if all susceptible persons who have been in contact with small pox are promptly vaccinated, an outbreak can be *stamped out* very speedily. In South-end during 1902 there were no less than 16 independent outbreaks of small-pox in different parts of the Borough. Yet only 7 secondary cases occurred, 6 of these never having been vaccinated previous to exposure to infection, while in the remaining one case 36 years had elapsed since vaccination. All these 7 secondary cases occurred in connection with primary cases where there had been delay in notification owing either (1) to medical assistance not being called in at once, or (2) to early errors in diagnosis. By means of efficient vaccination we have a control over small-pox such as up to the present is denied us over any other infectious disease. When the prophylactic use of diphtheria antitoxin properly applied has become properly understood, I think we shall have an approximately similar control over that dangerous disease, but the immunity conferred by diphtheria antitoxin against diphtheria is not so lasting as that conferred by vaccination against small pox. The difference lies chiefly in the fact that immunity is active in vaccination, but only passive in the case of diphtheria antitoxin.



## Preventive Measures.

These are given fully in my special report. Briefly they may be summed up as follows :—

- (1) Antecedent efficient vaccination.
- (2) Immediate isolation if a case of small-pox occurs.
- (3) Immediate efficient vaccination of all contacts (direct and indirect) as far as practicable.
- (4) Efficient disinfection of infected premises, and articles and contacts.
- (5) Surveillance of contacts for 15 or 16 days.

If contacts submit to disinfection and vaccination it is only necessary to keep them under daily observation ; irksome quarantine can thus be dispensed with. These were the measures adopted which proved so eminently serviceable in Southend in preventing the spread of small-pox while the disease was prevalent from January to June, 1902.

Hitherto the quarantining of contacts has proved both irksome and expensive. Quarantine was adopted in the first three or four instances of small-pox cases occurring in the Borough, but I subsequently abandoned strict quarantine for mere surveillance of contacts for 16 days after exposure to infection, provided vaccination and disinfection had been first carried out. Such contacts were allowed to return to their employments, and the Borough was thus saved considerable expense. It is gratifying to find that this method has now received the official approval of the Local Government Board. In a memorandum dated September 25th, 1902, it is stated "the Board are advised that, under ordinary circumstances, the quarantining at their homes of inmates of such (infected) dwellings is not necessary in districts in which sanitary matters are properly administered and vaccination and revaccination are efficiently carried out." . . . In exceptional cases, in which a Council are advised by their Medical Officer of Health that in the special circumstances it is essential that the inmates should remain in their own houses, the Board would be prepared to sanction a reasonable expenditure in securing such a result.



In March, 1901, an important memorandum was issued by the Medical Officer to the Local Government Board on the steps specially requisite to be taken in places where small-pox is prevalent (1) by Boards of Guardians (2) by Sanitary Authorities.

In February, 1902, a useful memorandum on revaccination was issued by the Medical Officer to the Local Government Board. From this I quote a few important paragraphs.

“ The protection which is afforded by primary vaccination in infancy should be renewed as a matter of regular system by revaccination at least at the approach of puberty, and earlier in the case of children, whose marks of primary vaccination are few, small, or indistinct. . . . A repeated revaccination is also advisable in the case of persons who have not been successfully vaccinated within the previous ten years when small-pox threatens.”

“ Public vaccinators are authorised to afford revaccination with glycerinated calf lymph gratuitously to all persons over 10 years of age, who have not previously been successfully vaccinated or revaccinated within a period of ten years.” As the term of five years for which the Vaccination Act of 1898 was made law has almost expired, the subject is at the present time receiving the earnest attention of the Incorporated Society of Medical Officers of Health and other bodies. Since this was written I understand that the Government intends to extend the Act of 1898 for another year.

## **Chicken Pox.**

This disease was notifiable in Southend under the Infectious Disease (Notification) Act throughout 1902. In all there were 212 notifications of chicken pox. Of these three were subsequently withdrawn and notification of small-pox substituted. In my annual report for 1901 I pointed out how in *unvaccinated* communities small-pox like chicken pox and other infectious exanthematous diseases, was a disease chiefly affecting children. On the other hand by means of infant vaccination immunity against small-pox during childhood is attained. Consequently small-pox in vaccinated persons is now practically confined to the periods of adult life when the immunity afforded by infant vaccination is on the wane. Chicken pox, however,

is unaffected by vaccination, and still remains essentially a disease of childhood. Any case, therefore occurring in a person no longer a child "*ipso facto*" excites suspicion. My experience during the year demonstrated this. Two cases notified as chicken pox were aged respectively 16 and 59. These proved to be cases of small-pox. On the other hand an unvaccinated child of 10, who was notified as suffering from chicken pox, was found to be really suffering from small-pox.

The age incidence of chicken pox is exemplified by the following table of cases occurring in the Borough :-

Under 13	1-5	5-15	15-25	25-65	65 and upwards
13	70	119	6	4	0

Of the six notified cases between 15 and 25 years, one was found to be small-pox. Of the four notified cases between 25 and 65 years, one was subsequently withdrawn, and one was subsequently found to be really small-pox.

Thus the actual numbers of undoubted cases of chicken pox were :—

Under 15 years	Over 15 years
202	7

Contrast these with the age incidence of cases of small-pox among vaccinated and unvaccinated respectively.

Table showing incidence of small-pox on unvaccinated :—

0-1	1-5	5-15	15-25	25-65	or	Under 15	Over 15
1	2	4	1	2		7	3

Incidence on vaccinated :—

0-1	1-5	5-15	15-25	25-65	or	Under 15	Over 15
0	0	0	3	11		0	14

The zymotic death rate from small-pox during 1902 was 0.12  
 „ „ „ „ chickenpox „ „ „ nil

A copy of my special report on small-pox is appended for reference and further information.

## Small-Pox.

Stoppage of milk. Although there is no recorded instance of the infection of small-pox being conveyed by milk, the following circumstances induced me to advise that the further milk supply from Prittlewell Priory Farm should be suspended for a few days in order to permit of disinfection and limewashing of the dairy premises.

On April 25th, 1902, about 5 p.m., I received a notification of a case of small-pox at 2, Station Avenue. I forthwith visited the house, and ascertained that the patient was in the employ of Mr. Scratton, Prittlewell Priory. I further ascertained that two other employees of Mr. Scratton, both of them connected with the milk trade, lodged in the infected house. One of these, *a milker, was actually sharing the same bedroom* as the man who was ill with small-pox. I immediately visited the Priory Farm, (after making arrangements for the removal of the patient to hospital, and for vaccination and surveillance of contacts), and advised that no more milk should be sent out until the cows' udders had been cleansed, and the dairy premises disinfected and limewashed. This was consented to, and the public milk supply was accordingly stopped until May 3rd. In view of the ready compliance of Mr. Scratton with my suggestions, the Town Council subsequently allowed him £20 in compensation.

Section 4 of the Infectious Diseases (Prevention) Act gives a Council power to stop the sale of infected milk, without compensation; but to follow out in detail the provisions of the section would have involved the loss of several days time, and the milk would, in the meantime, have still been supplied to the public *just at the time when it was most likely, if infected, to carry infection*. Section 4 of the above Act, as it stands, is, therefore, only of use when a milk vendor will not enter into an immediate arrangement, or when the provisions of a temporary arrangement are being wilfully disregarded. Similar provisions to those contained in Section CX. of the Factory and Workshops Act, 1901, are desirable.

It should be in the power of any two or more members of the Council, in a case of urgency, acting on the advice of the Medical Officer of Health, to prohibit the sale of milk during the time that must necessarily elapse before the powers of Section 4 of the Infectious Diseases (Prevention) Act could be exercised.



## Scarlet Fever.

During 1902, 109 cases of scarlet fever were notified, as against 99 in 1901 and 142 in 1900. Of these 14 were imported. The number of infected houses was 91, as compared with 71 in 1901 and 119 in 1900. There occurred in 76 houses, one case; in 13 houses, two cases; in 1 house, three cases; and in 1 house, four cases.

The age distribution was as follows:—

1-5 years	5-15 years	15-25 years	25 and upwards.
19 cases.	76 cases.	10 cases.	4 cases.

The zymotic death rate was 0.03 per 1000 inhabitants, as compared with 0.06 in 1901 and 0.07 in 1900. The case mortality was 0.91 per 100 cases notified, a remarkably low mortality.

There is no doubt that on the whole scarlet fever is at present a milder form of disease than it used to be. This may be due to improved methods of treatment, but in my opinion it is partly due to recent advances in bacteriological knowledge, as this can be applied in a well administered Isolation Hospital.

Prior to the microscope being used as it is at present in ascertaining the bacterial nature of throat products in scarlet fever wards, diphtheria bacilli, or streptococci, &c., worked havoc without let or hindrance for perhaps several hours or days *before* clinical signs were sufficiently developed to indicate the nature of the affection. Nowadays on the slightest sign of abnormality in throat or nose we can make a bacteriological investigation and bring preventive measures to bear before the germs have time to do much mischief. During the last year or two hospital isolation for scarlet fever has been attacked with acerbity in some quarters. I think, however, that the present low death rate from scarlet fever is largely due to these beneficent institutions so wisely provided by enlightened municipalities and other bodies. Probably from every isolation hospital, however well administered, a certain very small proportion of cases again carry out infection in spite of all precautions taken. The great remedy for this is

to have at least two separate blocks reserved for scarlet fever patients, so as to be able to separate convalescent from acute cases. With such available accommodation, and strict administrative measures, the numbers of "return" cases will, I believe, steadily diminish.

A considerable proportion of cases which are reckoned as "return" cases are really not such, but are due to independent infection. I have been fortunate enough to note two such instances, the second case in the house fortunately occurring in each instance a day or two before the discharge of the first patient from hospital. Had this independent infection been delayed until a day or two *after* the discharge of the first patient, the hospital would, without doubt, have been credited with these cases as "return" cases.

During 1902 two possible "return" cases occurred. In these instances the printed warning given to each parent on the discharge of the first case had been disregarded, and the child had been allowed to mix freely with the others directly after discharge, but it by no means necessarily follows that these second cases were really return cases. Wherever it is practicable I recommend that a discharged patient shall go to stay with a relation who has no children for a week at least before returning to the family. Well-to-do people can often arrange for a month, but a certain proportion can make no such arrangement, and these are just the very ones where the home conditions are such that the warning as to keeping the discharged patient separate from the others for a fortnight, cannot or will not be observed.

## **Post Scarlatinal Diphtheria.**

Ten years ago the incidence of post scarlatinal diphtheria amongst 14,548 cases of scarlet fever admitted into the Asylums Board Hospital during the year 1893 was 1.4 per cent. of which 58.3 per cent. were fatal. In fever hospitals generally, scarlatina convalescents are not infrequently attacked with diphtheria, which is attributed to the introduction into the scarlatina wards of unrecognised cases of diphtheria. If this be correct post scarlatinal diphtheria could be prevented by the early recognition and isolation of such



cases. The chief difficulty is that the clinical diagnosis of diphtheria is often impossible, especially in the acute stage of scarlet fever. Consequently, I have adopted a routine method of examining bacteriologically the throat products of every case of scarlet fever admitted to the Sanatorium, and by this precaution I found the diphtheria bacillus present in the throats of 5 out of 88 patients admitted during 1902 as cases of scarlet fever. I was thus enabled to take special measures in the treatment of these cases, both to prevent diphtheria developing in themselves or spreading to other inmates of the ward. Further, it is my practice to bacteriologically examine every case which, when convalescent, suddenly develops sore throat or nasal discharge. Quite recently I observed that a child who had been three weeks in hospital, looked pale and had a nasal discharge. I made a bacteriological examination of this and found the diphtheria bacillus present. As no fresh case had recently been admitted with diphtheria bacilli, and the ward was quite a new one, I had to institute an inquiry for the explanation of this case. I made a bacteriological examination of every other patient in the ward, and found two more children with diphtheria bacilli, though no clinical symptoms were evident. The nurses were next examined and found to be free, but I found a wardsmaid with enlarged tonsils, with diphtheria bacilli present, but without membrane or other clinical signs of diphtheria. She said she had had a sore throat for a couple of days a month previously, but had made light of it, as she was then on duty in the administrative block. It is, of course, impossible to say for certain whether she was the source of introduction of diphtheria bacilli into the ward, or was merely a contact, but the previous sore throat turns the balance of probability in favour of the former theory. Prior to this she had been engaged for a short time in the laundry, but had not been employed at all in the diphtheria wards.

Prompt prophylactic administration of antitoxin and other treatment prevented the development of any *clinical* signs of diphtheria in any of the other patients whose throats harboured diphtheria bacilli, except in one child, who had a transient sore throat with slight exudate. The throat products of the other patients in the ward were examined from day to day, but no further case of implantation of the diphtheria bacilli occurred, special precautions being observed by the nurses under my direction.



## Enteric or Typhoid Fever.

The number of cases notified during the year was 105, including four imported cases, and in addition two notifications were withdrawn, while one case was notified by two doctors.

I have fully reported in a special report on cases which occurred during June, July, August, and September, which were the chief months of typhoid fever prevalence in Southend during 1902. I have succeeded in clearly tracing by an abundance of evidence that the one feature common to the large majority of the cases was the consumption of cockles which came from Leigh. Not the least significant feature in my special report is the fact that 54 per cent. of the 58 cases of typhoid fever which occurred during June to September, 1902, occurred among that very small section of the whole population which eat cockles, and which I computed could not exceed (and probably did not nearly approach) 5 per cent. of the entire population.

Soon after I had reported in my monthly report for June, 1902, on the cases which had occurred during that month, confirmation began to come in from outside districts, and especially from London. Thus I received a letter from Dr. Bryett, M.O.H. for the Metropolitan Borough of Shoreditch, dated July 7th, stating that two cases of typhoid fever had come under his notice, in which both the patients were stated to have eaten cockles and oysters in Southend on a date which corresponded with that of infection. He enquired whether I had any reason for associating any cases of typhoid fever occurring in Southend with the consumption of shellfish. In a letter dated September 2nd, 1902, Dr. Bryett again wrote on the matter, stating that he had had six further cases certified, in which typhoid fever had followed the eating of cockles in Southend. He gave me particulars of these cases as follows :—

Name.	Age	Sex	Address	Date of visit to Southend June.	Date of invasion July.	Date of Removal to Hospital July.
W.C.	16	M	121 St. Rd.	26 & 27	8th	24th
J.H.	36	M	11 G. St.	28th	7th	28th
T.B.	21	M	40 M. St.	29th	14th	31st

				Aug.	Aug	Aug.
L.S.	28	F	67 B. St.	4th	20th	29th
C.C.	11	M	113 P. St.	4th	20th	28th
J.B.	15	M	76 L. St.	9th	21st	29th

On July 5th, 1902, I wrote to the M.O.H. for Leigh, and received from him a reply to the effect that he had reason himself to suspect cockles as the cause of cases of typhoid fever occurring in his own district.

On August 7th, 1902, I again wrote to the Leigh M.O.H. to inquire what was being done by the Leigh Urban District Council to remedy the matter. In his reply dated August 12th, 1902, he stated that the matter had been brought before the Leigh Council, and added, "I can assure you that steps will be immediately taken to prevent the spread of disease by the cockles." Unfortunately I had no power to prohibit, or ask the Southend Town Council to prohibit the sale of cockles in Southend. Further evidence of the widespread mischief came to hand in a pathetic letter which I received, dated August 16th, 1902, from which I venture to make a few extracts :—

121, St.—Rd.,  
Hoxton, N.

August 16th, 1902.

"I have just come from the deathbed of my youngest son (within a few days of his birthday) who has given up a promising life to typhoid fever. . . . I have no doubt in my mind he has fallen a victim to eating cockles. He was at Southend June 26th, came home 27th, fell off his food, went to the Middlesex Hospital July 24th, died there to-day at 11.30.

I not alone know of this, but several neighbours have complained of illness *from the same cause.*"

On October 2nd I received a letter from Dr. McLeary, M.O.H. for Battersea, giving particulars of two cases of typhoid fever in his district, which he attributed to shellfish obtained from Leigh. He wrote not knowing whether Leigh was in Southend district. On December 8th I had a letter from Dr. Collingridge, M.O.H. for the City

of London, (writing under the same impression that Leigh was under the administration of the Southend Town Council), attributing several cases of typhoid fever which had occurred in London to cockles eaten in the city, which had come from Leigh. I referred him to the M.O.H. for Leigh.

This massive independent evidence of the specific pollution of cockles from Leigh, naturally resulted in the Fishmongers' Company refusing to accept cockles brought from the Leigh Creek. This action was taken chiefly in their own interests, but really subserved the interests of the public health. The matter was brought before the Leigh Council by a letter from myself to their Medical Officer as long ago as July, 1902, and several months had elapsed before the Fishmongers' Company took action in the matter. Yet I can find but little evidence of any systematic or serious attempt in the meantime to remedy this great evil.

When the seaside season was over, and the infected cockles no longer came into Southend, but went direct to London, dealing disease and death in the metropolis as they had previously done in Southend, the matter became too serious and evident, and could no longer be attributed to "a visit to Southend." The Fishmongers' Company in self defence were compelled to take action and prohibit the importation of cockles from Leigh. This was spoken of as a sudden and unexpected blow, but six months of warning and protest had been only resented meanwhile.

At length, in January, 1903, the Leigh Urban District Council has issued a report which contains some obviously inconsistent statements. Thus in one paragraph it is stated that "solid sewage is deposited in the Ray Gut and on the Leigh foreshore which has been traced from the Southend Sewer Outfall" (which, by the way, lies about *four miles below* Leigh, and runs out a mile from the shore, special precautions being taken as far as possible to permit sewage to flow only during the ebb tide). In spite of this acknowledgment of sewage pollution (whether from Southend or elsewhere is at present immaterial), a few paragraphs later it is suggested that if the cockles are laid on the mud flats instead of in the creek, and certain other precautions are taken, the danger arising from the cockles will be



obviated. I am sure that the remedies suggested, though they will certainly be a decided improvement on the present state of affairs, will not satisfy the sanitary authorities of London or Southend, as meeting all the necessities of the case. If the suggested measures are faithfully carried out, and the cockles are more thoroughly cooked in the future, no doubt *fewer* cases of Typhoid Fever will occur through cockles from Leigh—but I doubt if they will altogether cease, as Dr. Klein's experiments indicate otherwise.

My investigations into the causation of typhoid fever in Southend (as recorded in my monthly reports since June, 1902, and in my special report) have demonstrated to the satisfaction of critical scientific minds that in showing the part played in the production of typhoid fever by so-called "*boiled*" cockles, I have determined and brought to light the principal explanation of the endemic prevalence of typhoid fever in Southend.

The relation between typhoid fever and oysters and other forms of shellfish *eaten raw* has, of course, been generally recognised for some years, but cockles were not placed under the ban, because it was thought they must be sterilized by cooking. The series of cases in June and the following months enabled me to show beyond cavil that even so-called "*boiled*" cockles *could* convey the infection of typhoid fever. Subsequent laboratory experiments clearly proved that the plunging of cockles into boiling water for a minute was insufficient to sterilize them.

This fact, I contend, clears up the infection agent in a large number of cases of typhoid fever in *previous* years, not only in Southend but in London and elsewhere.

The occurrence of typhoid fever among several well-known residents in Winchester, Southampton, &c., following upon the eating of oysters at a mayoral dinner, once again brought the subject of shellfish prominently before the public, and led to extensive laboratory experiments with shellfish from different sources. The result of these experiments showed that a very large number of shellfish layings in different parts are more or less polluted with sewage. The question of the eating of shellfish is, therefore, a very important one to settle. From one point of view the matter appears so simple that

it seems a wonder how there can be two opinions as to the eating of shellfish that have come from any laying where there is any possibility of sewage pollution.

Who would think of laying down any ordinary article of diet in sewage-polluted water, no matter how diluted? Such a procedure is obviously insanitary. The keynote of sanitation is cleanliness, and how can such a procedure be defended as partaking of cleanliness? Yet foods which are consumed raw, such as oysters, or partially cooked, such as cockles and mussels, are permitted to be cultivated and laid in such sewage polluted waters, more or less diluted, all round the kingdom. Some have argued that if shellfish become contaminated so must other forms of fish. Possibly, but other forms of fish are not eaten raw, and (equally important) they are first gutted and cleaned, and then either thoroughly boiled or fried in fat, the temperature of which reaches a higher degree than that of boiling water. Still I have a suspicion that a few cases of typhoid fever have been due to the handling of uncooked fish (as by cooks in preparing fish for the table) or to the eating of imperfectly cooked or insufficiently gutted or cleaned fish, *or to the laying of fried fish sold in shops in juxtaposition to, or on slabs which have previously been used for shellfish.* These are possible but rare channels of infection, which must be borne in mind in view of the conclusive proof we now have of the frequent infection of all forms of shellfish.

The outbreak of typhoid fever in Southwark in 1900, investigated by Dr. Hamer, appeared to be due to the consumption of fried fish.

Have we any reason to think we can stamp out typhoid fever in Southend? I reply that I think we can attain very near to this ideal. How?

(1) By avoiding the touching as well as eating of all forms of shellfish, except such as are beyond any suspicion of sewage contamination.

(2) By avoiding eating any uncooked vegetables which have been subjected to manurial pollution.



(3) By the early removal to hospital of any case of typhoid fever which may occur. A large proportion of diseases are secondary, consequent upon the nursing of patients by untrained relatives at homes.

(4) By careful and constant attention to effective sewage schemes, and to frequent and effective disposal of all forms of trade and house refuse.

(5) By all forms of cleanliness, which must apply particularly to our water, milk, and food supplies, especially shellfish.

I ventured in my special report to express my belief that if the eating of shellfish were abandoned in Southend, the incidence of typhoid fever would lessen by fully one half. I really understated the limits of my belief.

Of the four *imported* cases notified during 1902, two had recently eaten oysters at Ipswich, one had eaten cockles in London, and the fourth was too ill to give any information. She had, however, come from Southampton, which recent history has shown is a place supplied with polluted oysters from Emsworth. Of the 101 remaining cases there was a history of the eating (or handling) of shellfish in 69 cases. In addition there were certainly eight secondary cases arising from these, which were, therefore, *indirectly* attributable to shellfish. Thus we can account for at least 77 per cent. of our cases as in some way connected with shellfish. Of the remainder, five occurred at Thorpe Hall Farm Cottages, where a few months previously a child, who had eaten cockles, had typhoid fever. It is now recognised that the germs of this disease may, long after recovery, be found in the urine of persons who have suffered from typhoid fever.

The Thorpe Hall Cottages are provided with a midden-privy with two compartments back-to-back under one roof, and a common receptacle or cesspool for excreta beneath. At the time of the outbreak of typhoid fever at the farm, flies were numerous and could easily fly from one cottage to the other, or from the privies into both.



The source of infection in my opinion was probably the child who had typhoid fever some months previously.\*

The source of water supply at this farm is a shallow well, situated about 100 yards from the midden-privies, but only about 20 yards from a large cowshed, in which are kept about 50 cows. The water from this well was examined, and found to be rather high in chlorides and nitrates, indicating some previous surface source of origin, though there were no nitrites, and only a trace of free ammonia. It was, therefore, forbidden for use unless previously boiled.

In five cases of typhoid fever, which occurred in the Borough, uncooked vegetables were suspected as the probable vehicle, while in a very small proportion sanitary defects were found on the premises.

There was no evidence of drinking water or milk borne typhoid at any time during the year. The greater proportion of our typhoid fever during the year was really imported either through infected cockles being brought into the town, or by persons visiting Leigh and there partaking of cockles. In several instances the cockles were *bought and eaten in Leigh*, and our local fish shops were in no way implicated in these instances.

It is sad to think that such is the perversity or carelessness of human nature, that in spite of warnings which the Health Committee had placed at three different points along the foreshore, directing public attention to the danger of eating shellfish from sewage-contaminated sources, so much preventable illness should have occurred.

I would suggest that these notices be printed and more freely exhibited in other parts of the town, as well as along the front.

The reputation of the town as a health resort is likely to be injured, when, as shown in one of the letters I have quoted above, people go home to London or elsewhere, fall ill and compare notes, and agree in attributing their illness to their visit to Southend.

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\*If these five cases were undoubtedly secondary to the previous cockle case the percentage of cases connected with shellfish would be raised to 82 per cent of the total number. Even of the remainder, some gave a doubtful history as to cockles.

The shellfish merchants must protect their own interests by taking every care to get their shellfish from unpolluted sources.† They received this warning from me as long ago as September, 1901 (vide annual report for 1901 p. 23). It is difficult for some persons to understand how it is that many people can consume infected shellfish with impunity. More than one shellfish merchant has said to me, "I eat cockles every day, and never have been ill." It is the same story with other poisons. Some persons are little if at all affected by doses which would kill other persons. Moreover, acclimitisation has to be taken into account. A person accustomed to a particular poison (such as tobacco for instance) can consume large quantities without any apparent ill effect, while a person who approaches a cigar for the first time in his life suffers from well marked symptoms of poisoning. It is obviously a fallacious argument that, because some persons are not rendered ill by eating cockles, therefore cockles cannot cause illness in other persons. One positive case is worth any number of negative cases in evidence.

The number of deaths from typhoid fever during the year was twelve, and the zymotic death rate from this disease was .37. The case mortality was fortunately low, being only 11.42 per cent. 66 notified cases were removed to hospital, and of these two were subsequently found to be suffering from another disease ; one of these died. Among the 64 remaining cases six deaths occurred, or a case mortality of only 9.3 per cent.

My researches into the causation of typhoid fever in Southend were embodied in a paper which I read before the Congress of the Sanitary Institute, which was held in Manchester in September, 1902. At the close of the discussion I submitted the following resolutions‡ to the section in which the paper was read, with the result that they were carried unanimously.

" That it is the opinion of this section that in the interests of the public health the laying down of all edible forms of shellfish in

† I am glad to report that this is being arranged for.

‡ At the end of January, 1903, the Public Health Committee of the London County Council passed an identically worded suggestion to be made to the Local Government Board.



sewage-polluted creeks or other dangerous localities should be prevented by law under heavy penalties."

"That all unpolluted layings, fattening beds, and storage ponds at present in use should be protected by law from pollution by sewage by any person or Sanitary Authority."

Prior to June, 1902, when I emphatically stated that in my opinion the outbreak of typhoid fever in Southend in that month was due to the ingestion of sewage-polluted cockles, this form of shellfish was not suspected generally among Medical Officers as a source of typhoid fever, because cockles were generally supposed to be boiled, and it was well known that the bacillus of typhoid fever was killed at a temperature considerably below that of boiling water.

Having, however, seen for myself that the so-called boiling was no boiling, and that the cockles were removed from the steaming hot water directly after the shells opened, and before the interior of the cockles could reach anywhere near the boiling point of water, I knew it was quite possible for this form of shellfish, if infected, to convey the infection of typhoid fever. The condition of the banks of the Leigh Creek at the cockle layings, together with the fact that the effluent from the Leigh sewage works entered the stream a few hundred yards above the cockle layings, sufficiently indicated that the layings were polluted, even if I had not known that some cases of typhoid fever had occurred in Leigh.

I, therefore, wrote urgent communications both to the Local Government Board and the County Medical Officer (Dr. Thresh) stating the facts and asking for prompt investigation.

Dr. Thresh at once took the matter in hand, and taking samples both of the Creek water and of the cockles for bacteriological examination, conclusively proved that both were grossly contaminated by sewage bacteria. At this point it is necessary to observe that the public or lay mind is under a misapprehension as to the meaning of the purification of sewage by contact beds, etc., as, for instance, by Mr. Bailey Denton's installation at Leigh. When we speak of the purification of sewage, we simply mean an improvement on the condition of crude sewage. The Thames Conservancy has a standard of



purification for sewage effluent before it will authorise the discharge of any such sewage effluent into the river. It is possible for a sewage effluent to be sufficiently purified to pass this chemical standard, and yet still be exceedingly dangerous through its containing disease-producing bacteria. The purification of sewage is only one of degree, as ascertained by an arbitrary physical and chemical standard. If, however, a bacterial count were made the standard, no effluent could pass as pure unless a large area of suitable land were available through which the effluent *must* pass *after* it has been treated in the contact beds.

The Local Government Board rightly lay great stress on the final land treatment of sewage effluents. It is, however, often very difficult or impossible to secure sufficient suitable land to effect this final purification, and certainly at Leigh the sewage effluent does not receive any land treatment, but passes straight from the contact beds into the Creek waters. Thus, though a certain degree of chemical purification has been effected, sufficient at any rate to meet the requirements of the Thames Conservancy, there would be found hardly any difference bacteriologically, either in the number or kind of bacteria present in the effluent as compared with the crude sewage before treatment. The lay mind having crude notions as to the purification of sewage is in ignorance of these points of important distinction, which can, of course, be only scientifically appreciated. Hence much nonsense was talked in Leigh about the sewage effluent being quite pure and *fit to drink* ! and incapable of contaminating the cockles laid on the banks of the Creek. The results of Dr. Klein's experiments on cockles made on behalf of the Local Government Board were very opportunely published a month or so after I had reported on the matter to the Southend Town Council. These experiments are referred to at page 15 in my special report. It is very necessary to fully appreciate the importance of Dr. Klein's observations that the bacilli of typhoid actually *increased in numbers within the bodies of the cockles, even though the infected cockles had lain for three days in clean, salt water.*

Dr. Allan, Medical Officer of Health to the City of Westminster, deserves great credit for the pains he took to establish the connection between cockles from Leigh and a case of typhoid fever which

occurred in his district in the year 1901. This case was fully commented on in Dr. Allan's annual report for 1901, but remained in obscurity until he referred to it in the discussion on my paper at Manchester. Dealing with only a single case Dr. Allan's conclusions could hardly have carried conviction at the time, but in the light of subsequent events his careful investigations and conclusions based on a single case of typhoid fever deserve special mention. The outbreak of typhoid fever in Southend during June, July, August, and September, 1902, enabled me to bring convincing evidence as to the part played by infected cockles, so much so that Sir James Crichton Browne, in his address to the Sanitary Inspector's Association on January 3rd, 1903, said: "Until quite recently it was believed that the cockle had all evil scalded out of it, but Dr. Nash, of Southend . . . has dispelled that illusion. He has taught us that the cooking of cockles is partial and ineffectual from a bactericidal point of view."\*

During 1902 I have been able to show beyond all question that "cooked" cockles, as hitherto prepared for the market, are capable of conveying the infection of Typhoid Fever if from contaminated layings.

The causal relationship between polluted shell-fish and Typhoid fever having been demonstrated again and again, it remains to inquire what action has hitherto been taken to remedy the matter.

To Dr. Newsholme, of Brighton, belongs the credit of having first impressed his Sanitary Authority with the necessity of moving in the matter. The representations made by the Brighton Sanitary Authority largely influenced the Local Government Board in appointing a medical inspector, Dr. Bulstrode, to make a detailed inquiry into "Oyster Culture in Relation to Disease." Brighton again, in 1896, attempted to obtain Parliamentary powers authorising the Sanitary Authority to prohibit the sale within the Borough of shell-fish known or suspected to be the cause of infectious disease. In 1899 the Government introduced an Oysters Bill, to lay upon local authorities the duties of inspecting oyster layings within their

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\*The "Sanitary Journal," January, 1903. p. 185.



boundaries, and prohibiting the use of contaminated oysters from these layings; but even this moderate measure did not become law. The Brighton Bill was in my opinion far preferable. In 1899 the Southend Corporation promoted a Bill which contained a clause relating to shell-fish on the foreshore, but the intended Bill was rejected at the statutory meeting of owners and ratepayers.

At Manchester in September, 1902, I suggested legislation on certain lines as recorded in my special report, page 18. These provided for:—

- (1) Penalties for laying down edible shell-fish in polluted streams.
- (2) Penalties for pollution of layings and cultivation beds at present pure.
- (3) Registration, efficient supervision, and inspection of all layings.
- (4) Powers for Sanitary Authorities to prohibit the sale of such shell-fish within their districts, as in the opinion of the Medical Officer of Health were causing or *likely to cause* disease.
- (5) Clauses to deal with imported shell-fish from Continental sources.

There can be no possibility of doubt that such legislation is urgently needed, and as the Corporation of the City of London and the London County Council have since approached the Local Government Board on the subject, there is greater hope of success in this direction than when action was limited to one or two provincial sanitary authorities. I am strongly of opinion that the Southend Town Council should appoint a deputation to wait on the President of the Local Government Board towards securing legislation on the subject applicable to all shell-fish layings. Short of this the Borough should seek Parliamentary powers to prohibit the sale within the Borough of shell-fish known or suspected to be the cause of disease.



The monthly distribution of cases of Typhoid Fever notified in Southend was as follows during 1902 :—

January	...	3	August	..	9
February	...	4	September	...	13
March	...	1	October	...	20
April ...	...	2	November	...	2
May ...	...	4	December	...	7
June ...	...	21			
July ...	...	19	Total	...	105

The more respectable shell-fish merchants in the Borough are taking steps to secure their shell-fish from unpolluted layings. This is as it should be, and those who are obstinately unconvinced and indifferent must, of course, be prepared to bear the consequences which will surely follow.

It is a matter of gratification to me that my views and conclusions and suggestions have received the support of such eminent sanitarians as Sir James Crichton Browne, Mr. Shirley Murphy and Dr. Collingridge, for I am inclined to think that what remains of Typhoid Fever in this country is *largely*, if not *chiefly* due to the consumption or handling of infected shell-fish, and secondary cases arising from those thus infected. I have brought forward evidence in support of this contention, which I shall shortly publish elsewhere.

So important is the connection between disease and shell-fish, in my opinion, that I think it is our chief concern in this Borough in ridding this district of Typhoid Fever, and therefore I have ventured to deal very fully with the matter here. It will be of interest to give a brief historical sketch of the investigations in this direction which have hitherto been made, and of any action which has been taken in consequence.

As far as I can gather, Sir Charles Cameron, C.B., the distinguished Medical Officer of Health for Dublin, was the first, so long ago as 1880, to suggest that the typhoid bacillus might perhaps sometimes mingle with the sewage matter which, under certain circumstances, oysters undoubtedly contain. The late Sir Richard

Thorne-Thorne, K.C.B., principal Medical Officer to the Local Government Board, reporting on Cholera in England in 1893, recorded his conviction that the distribution of shellfish from Grimsby and Cleethorpes "had been concerned in the diffusion of scattered cases of cholera over a somewhat wide area of England." Early in 1894, Dr. Newsholme, Medical Officer of Health for Brighton, recognised the causal relation between contaminated oysters and some eight cases of typhoid fever, and reported on further cases from time to time. In November, 1894, Professor Conn, of Connecticut, clearly traced an outbreak of typhoid fever at the Wesleyan College, Connecticut, to contaminated oysters. The evidence adduced by Conn was most masterly and complete. Early in 1895 Sir William Broadbent and Sir Peter Eade published notes of cases of typhoid fever traceable to oysters eaten 10 to 14 days previously. Bacteriological investigations were made by Dr. Foot in connection with the Connecticut outbreak, and by Dr. Klein on behalf of the Local Government Board. These experiments proved that not only did the oyster thrive in water containing sewage matter, but took up into its interior certain intestinal bacteria.

In my Special Report which was laid before the Town Council a few months ago I referred to Dr. Klein's more recent investigations, which led to the inference that typhoid and intestinal bacteria actually increased in numbers within the bodies of cockles laid in clean sea water for 3 days after having been exposed to infected water for a short time.

In 1896 Sir Richard Thorne-Thorne issued a supplement to his report as Medical Officer of the Local Government Board embodying an exhaustive report by Dr. Bulstrode on the conditions under which edible shellfish are cultivated and stored at various places along the coasts of England and Wales. Regarding Leigh cockles, Dr. Bulstrode wrote "That the cockles laid down to clean in the bed of the Leigh creek are liable to pollution must I think be admitted." From this time medical attention generally was directed to the possibility of the causal relationship of oysters to typhoid fever, and from time to time reports of such cases were issued, while many more were never published though no doubt recorded in private notes of cases. In 1897 a small outbreak of typhoid fever at Blackpool was

traced to mussels, and a considerable amount of typhoid in Yarmouth in 1899 was traced to mussels laid in the Yare. In 1899, 85 cases of typhoid fever at Exeter were traced to *raw* cockles. At North Lynn in 1900 ten cases of typhoid fever occurred among 30 persons who had eaten clams from a spot about 3 miles below the discharge of the King's Lynn Sewage. In Southwark in 1900, an outbreak occurred between August 16th and October 10th, which was attributed by Dr. Hamer after careful investigation, to *fried fish*\* from one particular shop. In 1899 Drs. Thresh and Walter suspected cockles as the source of an outbreak of typhoid at Shoeburyness, and Lieut.-Col. A. M. Davies, R.A.M.C., who investigated the causes of typhoid fever among the military at Shoeburyness, attributed some six cases "with the greatest probability, short of certainty" to eating cockles. The investigations recorded above have taken the matter further into the region of practical, if not absolute, certainty. The Local Government Board requested me to send copies of my Special Report to the Royal Commission on Sewage Disposal, and I later was requested to send further copies.

I have been informed that I may be required to give further evidence before the Commission.

## **Diphtheria.**

There were 171 cases of this disease notified in the Borough during 1902, including 10 imported cases. In addition there were 9 notifications which were subsequently withdrawn. Throughout the year Diphtheria was more prevalent than usual.

The number of cases (including the imported cases) per 1,000 resident population was 5·3.

The zymotic death rate was 0·78.

The case mortality was 14·53.

The following table shews the population, rainfall, and total number of notifications with deaths of Diphtheria in Southend for each year since 1895.

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\* I have had reason to suspect fried fish as the source of origin of more than one case in Southend.



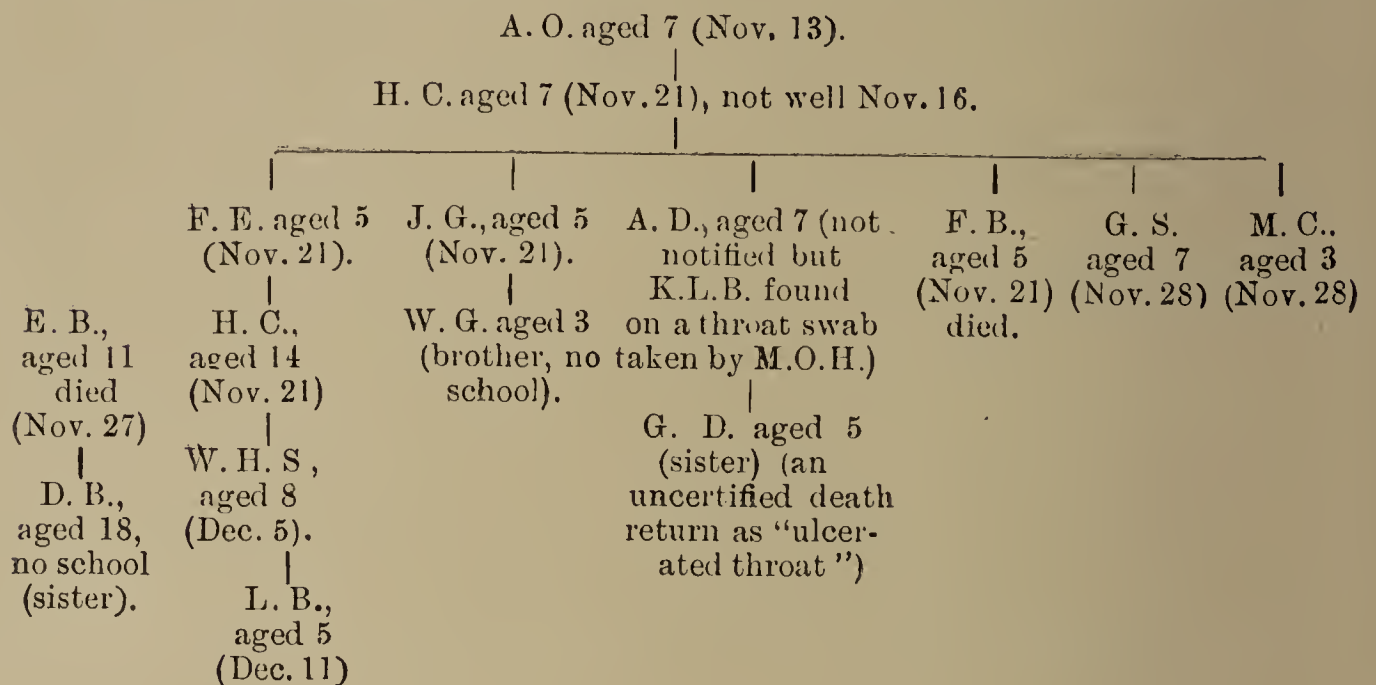
Year	1895	1896	1897	1898	1899	1900	1901	1902
Population	16,203	17,529	19,302	22,583	24,710	27,721	29,479	31,892
Notifications	35	58	25	46	16	21	85	172
Deaths	10	9	4	7	1	3	12	25
Rainfall in Inches	19.38	21.74	21.23	15.76	22.38	20.15	14.83	18.51

Average rainfall for 12 years, 1891-1902 19.80 inches.

In my Annual Report for 1901 I drew attention to what Dr. Newsholme pointed out a few years ago, viz.: that in certain years infection is more potent than in others. The larger epidemics occurring in the years of least rainfall, while epidemics on the largest scale occur when a series of years of deficient rainfall immediately follow one another. The table given above is certainly evidence in favour of this theory—there being a very serious deficiency in the rainfall in 1901, and although the summer of 1902 was showery, the total rainfall for the year was below the average for the ten years 1891-1900, making in all an accumulated deficiency for the two years of 6.3 inches.

I stated in my last report that a considerable amount of evidence has been adduced in support of this coincidence of epidemics of diphtheria with periods of deficient rainfall. The accumulating evidence shows I think that the relationship is more than merely coincidental, and is probably *indirectly* causal. How? Last year I suggested that deficient rainfall might be a factor in the evolution of pathogenic properties in the saprophytic prototype of the diphtheria bacillus. This, of course, is mere speculation. More probably dry seasons favour infection by a greater prevalence of germ-laden dust and flies, particularly in localities where no provision is made for the incineration of refuse, and where the refuse is deposited in the neighbourhood of the town. One fact is certain that both diarrhoeal diseases and untraceable sources of cases of infection of diphtheria have been more common in All Saints parish (which is in closest proximity to the brick fields where the town refuse is shot) than in other districts. When, however, a child has diphtheria germs implanted in its throat or nose, and is of school-attending age—my experience is that school attendance is the chief factor in the *spread* of the disease. This was exemplified in my Special Report on the outbreak of diphtheria in July and August which will be found appended to this Report.

Another instance of school infection is the following table which shows the connecting links between various cases which occurred among children attending the Brewery Road Schools in November and December, 1902, (last date of attendance at school given in brackets).



In my Special Report I mentioned two instances of imported infection into the Borough. Altogether 10 cases of imported disease were traced, but of course these by no means represent the total number of sources of infection introduced by visitors into the town. Many visitors come only for a day or two, and have gone again by the time that the seeds of disease left behind have taken root and become evidenced in others resident in the Borough who have been in contact with them. In most of these cases the people are not aware that they are the bearers of infection—in some cases no doubt they are not altogether ignorant of the fact. The matter is, however, a difficult one to bring home to an offender except in very occasional cases. In my Annual Report for 1901 I enumerated instances to shew how the diphtheria bacillus may lurk in the throats and noses of persons, for weeks, or even months after an attack of diphtheria. I showed how an untrained person or a casual observer—even though a medical man—might easily be deceived by the want of symptoms, while a bacteriological examination of the throat products would reveal the presence of the diphtheria bacillus potent for mischief if transferred to another susceptible person.

The above considerations explain how it is that in these days of freer inter-communication, and fast and cheap travel, when even



artisans and labourers with their families take their annual holiday or excursion, so insidious a disease as diphtheria exhibits a tendency to increase, and to form a sort of vicious circle between towns in constant inter-communication.

Prior to the great holiday craze, when fewer trains ran, and cheap excursion fares were of comparatively rare occurrence, Diphtheria was more a rural than an urban disease. Nowadays it is more rife in towns. I do not think it has changed in its nature. The altered conditions of civilisation, I think, fully explain its increased incidence in urban districts. Its original birthplace I strongly suspect was in organic refuse heaps (especially manure) in the country, but in these days when many, in increasing numbers, go to and fro, and Board Schools gather more and more susceptible children together, *human agency* has become the *chief* factor in bearing the seeds of disease, even though knowledge has increased.

Some have tried to deny the magnificent results of bacteriological research, which have culminated in the scientific production of diphtheria Antitoxin, by pointing to the increase of diphtheria in urban districts as evidence of its inefficiency. Such reasoning is illogical, and depends upon ignorance or want of appreciation of the facts. The considerations I have brought forward are quite sufficient to explain the increase of diphtheria. But for modern science, this disease would be even more prevalent than it is, and as fatal as it used to be when the mortality or case rate ranged from 30 to 50, or 60 per cent. Instead of this terrific death rate we find that in Southend though 171 cases occurred only 25 deaths were due to diphtheria in the whole Borough, or a mortality of 14·8 per cent. When Antitoxin is generally used as it should be at the earliest possible opportunity in sufficiently large doses, this mortality will be still further reduced, but the opportunity of early treatment is not always given.

Several of the 25 deaths occurred through delay, not necessarily reprehensible, in sending for medical aid. Fourteen deaths occurred among 59 cases not admitted to hospital, or a mortality of 23·72 per cent. In some of these instances, medical aid was not sought until the patient was moribund, and death took place in a few hours from



toxæmia. Among the 113 cases removed to hospital (that is 65·7 per cent. of the total number of cases) only 11 deaths occurred; one in the ambulance before the child could be carried into the ward, and a second within an hour of admission. Excluding these, 9 deaths occurred among 111 patients admitted to hospital who were not actually dying at the time of admission, or a mortality of only 8·1 per cent. The fatal cases occurred only among such cases as had been ill several days before admission. No fatality occurred among cases admitted within the first three days of the onset of the disease. The prompt administration of Diphtheria Antitoxin in sufficient dosage, quickly cut short the commencing ravages of the disease. The earlier in the disease that antitoxin can be administered the better for the patient. If it could be given in every instance on the first or second day at latest, diphtheria would be almost robbed of its terrors, but, even in the late cases which may eventually prove fatal—Diphtheria Antitoxin prolongs life and assuages suffering. It is a significant fact that no case required Tracheotomy in hospital, though some were admitted with laryngeal symptoms which, however, quickly subsided after Antitoxin was administered.

### **Supply of Antitoxin.**

I have had antitoxin stored at the Health Department for the convenience of local practitioners who can obtain it there at cost price. During the year 37 bottles of antitoxin have been supplied by the Medical Officer of Health. In a few cases I have administered doses of 500 units (P. D. & Co.) as a prophylactic. A few additional prophylactic doses of antitoxin have been administered by some of the local practitioners.

My own personal feeling is that swabs should first be taken from all contacts, and a prophylactic dose administered to such contacts as reveal diphtheria bacilli in their throats or noses, but are yet without symptoms. Parents are instructed to keep a careful watch on all other children, and to call in medical aid at the earliest indication of illness.

As valuable time is sometimes lost by waiting for the bacteriological result of swabs submitted for examination I have again and again advised that diphtheria antitoxin should be administered in

small doses pending the receipt of the result of examination. As in some cases the patients are unable to afford the cost of antitoxin administered thus or for prophylactic purposes, I again urged the Health Committee to authorise me in special cases to allow the cost of antitoxin, so administered at my request. Having considered the matter, the Committee recently (February, 1903) authorised me to refund to any medical practitioner the cost of 500 units of antitoxin in such cases as I can certify were necessary and the parents too poor to bear the cost.

Accordingly I issued the following circular letter to the local doctors, having first arranged with Mr. Superintendent Simmonds to kindly keep a few bulbs of antitoxin at the Police Office in case it might be wanted at night.

SOUTHEND-ON-SEA.

*February 18th, 1903.*

DEAR SIR,

I am making arrangements for the supply of Diphtheria Antitoxin in doses of 500 units for early administration in cases of suspected diphtheria pending Bacteriological report ; *also for prophylactic doses for contacts.* Diphtheria Antitoxin in these doses may be obtained at the Health Department between 9 and 6, or any time at the Police Station, Alexandra Street, at a cost of 1s. only for each bulb. *I wish to emphasise the importance of hypodermic administration of small doses of Diphtheria Antitoxin; directly Diphtheria is suspected.\** . . . . Swab cultivations are useful and necessary for clearing up diagnostic difficulties, but tend to be a snare if the administration of Antitoxin is deferred until a result is obtained ; moreover, the cost of 500 units is not prohibitive. In any particular cases if I were satisfied that the patients were too poor to afford the extra shilling cost, the Health Committee would refund the value of Antitoxin used, for every case among the poor † which I certified as having required the injection of 500 units for prophylactic or curative purposes.

As there appears to be some misunderstanding as to the meaning of X or "standard" Antitoxin, and XX or "special" Antitoxin, I beg to remind you that *no difference exists in the number of units or quality, but merely a difference of volume or quantity* of fluid containing an identical number of units. The advantage of using XX is that two bulbs of XX serum will only equal in bulk one bulb of X serum. As

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\* Of course followed by a full dose directly the suspicion is confirmed.

† That is persons unable to afford the cost of the Antitoxin.

each bulb contains, say 2,000 units of Diphtheria Antitoxin, it is obvious that by using two bulbs of XX you can inject 4,000 units in the same bulk or volume as you use when injecting 2,000 units of X. . . . . The question is really one of getting as large a number of units into as small a volume as possible for it is obviously inconvenient to inject large quantities of fluid subcutaneously. Therefore, if the case is a bad one 4,000 or 6,000 units can be administered in much smaller volume by using XX than by using X serum.

A word as to the method of administering Diphtheria Antitoxin may not be amiss as founded on a large practical experience. (1) Given by the mouth Diphtheria Antitoxin is of but little value (2) Given by the rectum, but little advantage is gained (3) Given subcutaneously the best and quickest results are obtained. For small doses of 500 units an ordinary hypodermic syringe with a large channelled needle is often sufficient.

I am, dear Sir,

Yours faithfully,

J. T. C. NASH. M.D., D.P.H.,

MEDICAL OFFICER OF HEALTH.

I regret to say the Town Council did not confirm this minute at the subsequent Council meeting. When adopted it will prove not only a humane, but a distinctly economical procedure.

No "return" cases of diphtheria were notified during 1902. This is probably due to special care being taken not to discharge any patient from hospital until a bacteriological examination of the throat products proved satisfactory.

### **Bacteriological Examination of Swabs from Suspected Cases.**

During the year 252 specimens were submitted to me for examination, and the diphtheria bacillus was found to be present in 83 cases.

The following table shows the monthly notifications of diphtheria during 1902 :—

January	...	...	...	...	...	15
February	...	...	...	...	...	11
March	...	...	...	...	...	11
April	...	...	...	...	...	9



May	...	...	...	...	...	7
June	...	...	...	...	...	3
July	...	...	...	...	...	15
August	...	...	...	...	...	38
September	...	...	...	...	...	17
October	...	...	...	...	...	14
November	...	...	...	...	...	16
December	...	...	...	...	...	15
						—
						171

In addition there were nine notifications withdrawn. One case only occurred in 107 houses ; two cases in 17 houses ; three cases in 6 houses ; four or more in 3 houses. Thus 39 cases were secondary to previous cases occurring in the same house. I suspect that this was partly due to children being put to sleep in the same bed to make room for seaside visitors, particularly in August, when the incidence of diphtheria was much higher than during any other month in the year.

### **Membranous Croup.**

No notification was made during the year, but a death certified as due to membranous laryngitis was found in the death returns. The attention of the certifying practitioner was drawn to the omission, and an explanation required. As the matter was evidently an oversight, no action was taken beyond a reminder as to the requirements of the Act.

### **Erysipelas.**

Thirty-five cases were notified, with one death, which occurred in an infant under one year of age.

The age distribution was as follows:—

Under 1	5-15	15-25	25-65	65 and upwards
2	2	6	20	5

Two cases were secondary to previous cases. One case was secondary to vaccination. In all 34 houses were invaded.

**Puerperal Fever.**

Two cases were notified during the year with one death.

**Plague, Cholera, and Yellow Fever.**

The Local Government Board deeming it desirable to provide for the display of a night signal by the master of every ship infected with any of these diseases, issued an amending order in December, 1902, directing that night as well as day signals shall be shown when the ship is within three miles of the coast of any part of England or Wales. The night signal is to consist of three lights in the form of an equilateral triangle to be shown at the peak or other conspicuous place not less than 20 feet above the hull of the ship. The light at the apex of the triangle to be white, while those at the ends of the base of the triangle shall be red in colour.

## Non-Notifiable Zymotic Diseases.

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### Measles.

There were 2 deaths recorded from this disease during the fall of the year.

The following table shows the number of deaths that have occurred in the Borough from measles since 1894.

1894	1895	1896	1897	1898	1899	1900	1901	1902
4	0	14	0	12	0	4	11	2

The zymotic death rate was 0·06 per 1000. Both deaths occurred in children under five years of age.

### Whooping Cough.

This is another zymotic disease of high fatality among very young children. Eight deaths were recorded, all of them among children under five years of age. Cases occurred throughout the year. One death occurred in each of the first, second and last quarters of the year, while five deaths occurred in the third quarter. The zymotic death rate was 0·25 per 1000.

The following pamphlet was printed by order of the Health Committee and widely distributed in the Borough. I am confident it acted beneficially in reducing the number of cases, for hitherto children suffering from whooping cough have been carelessly allowed to mix with others in most reprehensible fashion.

PRECAUTIONS AND HINTS which should be observed in managing and preventing Whooping Cough and Measles :—

Whooping cough is an exceedingly fatal disease in very young children. Every precaution possible should be taken to prevent infants and young children from taking the infection of Whooping Cough. The following Hints should be carefully noted :—



- I. Whooping Cough begins as a feverish cold with cough.  
*Every child that is not well should be kept apart from other young children from the very first.* After some days the cough comes in fits, followed in most cases by the characteristic "Whoop," and often by vomiting. The child feels an attack coming on, and if about, runs in dread to its parent.
- II. *All discharges that come from the nose and mouth of a child that has Whooping Cough are extremely infectious, and if received on to the mother's apron or dress, or into a pocket handkerchief, may easily prove a source of infection to another child. When a child coughs or vomits, what comes from its mouth and nose should be received into rags which should be AT ONCE burnt, or placed in a strong disinfectant, such as Jeyes' Fluid or Carbolic Lotion, and later boiled before using them again. If a pocket handkerchief is used, it must be treated in the same way at once, and never replaced in the mother's pocket or left lying about.*
- III. *Never allow any person who has young children to enter a room in which there is a child who has Whooping Cough or Measles. Such a person will almost certainly carry the infection home to her children, and you will perhaps have allowed sickness and death to go from your house to your neighbours'. Visiting at a sick house is one of the chief means by which infectious disease is spread.*
- IV. No child that has Whooping Cough should be allowed to mix with others, or taken by train or tram, or allowed to go to any church, school, party, or other meeting, until the Whoop has disappeared for at least a month.
- V. *All other children in the house should be kept apart from the sick child. They should be out in the fresh air as much as possible but should not be allowed to mix with other children, nor to enter any train or tram, or school, or church, or other place of meeting, until the house is free from infection.*

- VI. Whooping Cough is so serious a disease in young children, that medical advice should be obtained early, in order to prevent complications if possible.
- VII. The sick room should be kept well ventilated, by opening the window a little at the top, night and day. When the child is covered over in bed the window should be thrown widely open for a few minutes two or three times a day. A fire should be kept in the room to warm it, and to burn rags used for wiping the nose and mouth.

By order of the Health Committee,

J. T. C. NASH, M.D., D.P.H.,

*Medical Officer of Health.*

Disinfectants may be had free of charge at the Health Department, Clarence Road.

### **Influenza.**

Eight deaths were recorded during the year.

## Consumption and other forms of Tuberculosis.

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In my last Annual Report I very fully discussed this subject, having issued a special memorandum on Tuberculosis to the Health Committee in December, 1901. I adduced various reasons for and urged the importance of notification of Pulmonary Phthisis, when attended with expectoration containing Tubercle Bacilli. It has been abundantly proved that the influence of *infection* from persons already suffering from pulmonary consumption is the chief influence in the propagation of Tubercular diseases. I quoted Koch "that in the combating of all infectious diseases notification has proved indispensable," not only to inform ourselves as to the dissemination of the disease but mainly to give instruction, and provide disinfection when consumptives die or change their residences.

I stated my opinion that the combating of Tuberculosis by notification and the opportunities thus afforded for instructing infected households, would prove far more effective than the boiling of milk in preventing consumption. I pointed out that notification would enable the M.O.H. to give precautionary advice (not treatment, which is of course directed by the patient's own doctor) not only to the patient but to all the members of an infected household. At the same time advantage would be taken of the visit to note the sanitary (or insanitary) condition of the house, so that any notices required might be served. Instructions would be left at the infected house on *printed cards*. It is impracticable for the ordinary medical practitioner by word of mouth to go fully into all points affecting all members of the household as well as the patient ; nor could all the necessary precautions be remembered by any ordinary person unless in print or other convenient form for reference.

In Manchester and Brighton the voluntary notification of cases of pulmonary consumption has now been some years in force, and in



each instance the M.O.H. is satisfied that much good has resulted. In Norway, compulsory notification is in force for consumption as for other infectious diseases, and has worked well without hitch or complaint. Until notification is made compulsory consumptive persons may change their residences and leave behind them grossly infected rooms to jeopardise the health and lives of the next occupants. As regards the practical results to be gained by notification, as I stated in my last Annual Report, "We can hope for a better measure of success than in the case of any other infective disease, because we have more definite knowledge as to the degree and limited source of contagion in Tuberculosis than in any other infective disease."

The Health Committee considered the suggestions I made, and have directed that printed notices shall be displayed in prominent places of public resort discouraging spitting. Accordingly I drafted the following notice which is prominently displayed on the pier, in the tramcars, and in some of the public buildings. "Please do not spit about. The germs of consumption and other infectious diseases are often contained in the spit." I believe such public notices can only be productive of good, but that they will entirely do away with the offensive habit of careless expectoration in public places is more than can be expected. In the County of Glamorgan, spitting in the cars of certain tramway companies, and in covered places of public resort, has already been made a penal offence. Quite recently the Borough of Kensington has made spitting on the footways an offence punishable with a 40s. fine.

On January 12th, 1903, the Council of the National Association for the Prevention of Consumption and other forms of Tuberculosis unanimously passed the following motion. "That spitting on the floors of public buildings, on platforms, corridors, staircases, and public carriages or passenger boats, or in any covered place of public resort, should be forbidden by law."

The following views of Professor R. Koch, the world-famed discoverer of the Tubercle Bacillus, should be widely known. They bear on the question of the provision of Sanatoria as an indispensable part of the measures necessary for the diminution or extinction of Tuberculosis. Koch condemns the use of General Hospitals for

Phthisical patients. He gives the first place among preventive measures to the provision of institutions for *advanced* cases of consumption. He points out that the last three or four weeks of life are the worst for infection. The patient is too weak and ill to control his actions. Every cough, sneeze, etc., distributes the Tubercle Bacilli. On this point I find myself in strong agreement with Dr. Koch.

As for patients in the early stages of Consumption, I do not recognise that it is essential to insist on local Authorities providing special sanatoria. But when the accommodation at the Borough Sanatorium is increased, I shall probably ask the Town Council to give me permission to use a small ward for Consumptive patients in an early stage of the malady, with the object, not so much of effecting a cure while in hospital, as of educating the patient in hygienic methods and of impressing him with the benefit to be derived from free ventilation and good sanitation. Additional objects would be to instruct him in the proper methods of disposal of his sputum, and other precautions necessary to be observed to prevent the spread of infection. After a few weeks the patient would probably be greatly benefitted, and would then be discharged with the warning that to maintain improvement the hospital conditions as to ventilation, disposal of sputum, &c., must be observed as strictly as possible on his return home. He would also, after discharge, be able to instruct other persons in the measures necessary to prevent the spread of infection.

During 1902, in the Borough of Southend, 30 deaths were attributed to Pulmonary Phthisis, and 16 deaths to other Tubercular diseases. The ages at death were as follows :—

		Under 1	1 and under 5	5—15	15—25	25—65	Totals
Phthisis	... ..	—	... —	... 1	... 6	... 23	... 30
Other Tubercular diseases		5	... 5	... 1	... 2	... 3	... 16

Deaths from Tubercular diseases accounted for more than 10 per cent. of the total number of deaths due to all causes. The importance of dealing effectively with Tuberculosis cannot be overstated. In the absence of notification, I have to depend upon the



death returns, for knowledge as to where cases of Phthisis have resided. Disinfection of the room occupied by the deceased is carried out, and precautionary cards are then left. I venture to repeat the hope I expressed before the Incorporated Society of Medical Officers of Health in June last, that before long pulmonary consumption will be included among the compulsory notifiable diseases under the Infectious Diseases (Notification) Act. Then only shall we be able to bring really effective sanitary administration to bear on this great scourge in a manner which will steadily reduce its ravages, until at last it will take its proper place as one of the most easily prevented of preventable diseases. His Majesty's question as to preventable diseases "If preventable, why not prevented?" must be repeatedly asked, until a great national combination against tuberculosis on scientific lines is an accomplished fact.

Occasional specimens of sputa submitted to me for bacteriological examination at the Borough Laboratory have enabled me to learn of a few cases where earlier preventive measures could be adopted with the consent of the doctor and patient. I have also in one instance learned casually of the change of residence of a Consumptive person, and on my advice the rooms were disinfected, walls stripped and whitewashed and re-papered. The next tenants will thus be protected from a real danger.

In seaside towns, which consumptives frequent for the benefit of their health, often staying for only a few months or so, and then going somewhere else, this *change of residence* is, I think, one of the strongest arguments for compulsory notification, so that preventive measures may be taken for disinfection of the room previously occupied by a consumptive prior to its being tenanted by a fresh occupant. At any rate change of residence on the part of a consumptive should be compulsorily notifiable.

In combating Tuberculosis, I consider the education of the public as regards the conditions which make and keep health as very important. That teaching should begin in schools by the teaching of elementary hygiene. Cases in the last stages of consumption should be taken into special wards at a hospital. When



a patient is dying he is in the most infectious stage, because he is then too ill to care where he spits. I think it is then most important to encourage the isolation of advanced cases in wards which can be thoroughly disinfected, and under the care of those who have been trained in habits and methods of disinfection. I think a hospital or special ward for dying consumptives will prove to be one of the most humane of conceptions, and a philanthropist may wisely thus expend the money he wishes to use for the benefit of his fellow men. The patient himself will die as a rule under more comfortable circumstances, and will be spared the harassing reflection that he is a source of danger to his relatives. With proper precautions, relatives may be admitted to the dying consumptive with but little risk of bearing infection to others : much less than applies to other infectious diseases. At the same time they would be spared the obviously great risks run by them at present, through *protracted* exposure to infection in waiting on dying consumptives in small rooms, neither built nor furnished in a way to provide for daily cleansing and disinfection. Trained nurses are taught both theoretically and practically how to avoid acquiring infection, while at the same time their special training enables them to afford greater comfort to the patient, than the well-meaning but more ignorant efforts of his untrained relatives.

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## **Contagious Diseases of Animals.**

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During 1902, two places were declared to be infected with Swine Fever, viz., Telgrane's Cottages and Rectory Cottages, Southchurch, and a stable at Porter's Grange was, in March, declared a glanders infected place. In the latter case the provisions of the Glanders or Farcy Order of 1894 as to slaughter, burial and compensation were ordered to be carried out by the Health Committee.

## **Sanitary Department.**

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### **Workshops and Workplaces.**

In my annual report last year I referred to the Factory and Workshop Act, 1901, which came into force on January 1st, 1902. By this Act the law relating to factories and workshops was consolidated and amended, making considerable alterations in and additions to the duties of District Councils in regard to each class of place, viz. : factories, workshops and workplaces. Under section 132 of this Act every Medical Officer of Health is required for the future in his Annual Report to the Council to report specifically on the administration of the Act in workshops and workplaces so far as the matters under the charge of the Council are concerned. Under the previous law the occupier of every factory and workshop was required to keep lists of the names and addresses of outworkers in certain classes of work specified by the Secretary of State. Now he is required, in addition, to send a copy of the list to the Town Council on or before the 1st of February and the 1st of August in each year. I accordingly sent circular letters of reminder to the occupiers of premises where workshops existed for the making, cleaning, washing, altering, ornamenting, finishing and repairing of wearing apparel, and any work incidental thereto, and to the occupiers of those used for cabinet and furniture making, and upholstery work.

These places, as far as Southend is concerned, are the only ones among those specified by orders of the Secretary of State to which the provisions apply. In accordance with the requirements of the Act the names and places of employment of such outworkers included in the lists sent in, as were found to be residing in other districts have been sent to the Councils of such districts.

Under sections 107-115 of the Act of 1901, the Town Council now has important powers of controlling the conditions under which work is done in the homes of the workers in connection with the making, cleaning, washing, &c., of wearing apparel. The provisions briefly apply to (1) unwholesome dwellings (2) infected dwellings. No occasion arose during 1902 to make me advise the Council to exercise their prohibitive powers under the Act.

By sections 2, 3, 7 and 8 the Town Council is made the authority responsible for the sanitary condition of the workshops and workplaces in the district. During 1902, 467 visits of inspection were made. It will be seen from the appended tabular statement that the general condition of (1) *cleanliness* was good, only 6 notices requiring to be served under the Public Health Acts.

As to (2) *air space*, the general condition was good. In only four instances was there *overcrowding* in the sense of the Act, and the nuisance in each instance was immediately abated on drawing the attention of the occupier to the minimum of 250 cubic feet of air space (or during overtime 400). A card is now exhibited showing the number of persons who may occupy a workroom. The general conditions as to (3) *ventilation* are also good, and in no case was it necessary to serve any notice under section 91 of the Public Health Act. No workshops where other than men only were employed failed to meet the provisions of the special requirement as to ventilation introduced for the first time by the Act of 1901.

(4) *Drainage of Floors*. Section 8 requires that in every workshop or part of a workshop in which any process is carried on which renders the floor liable to be wet to such an extent as to be capable of removal by drainage, adequate means shall be provided for draining off the wet. (This provision does not apply however to workshops in which men only are employed). In addition to a general fulfilment of this requirement, racks were provided in three instances for laundresses to stand upon.

**Bakehouses** (sections 97-102). The general statutory requirements as applied to all bakehouses may be summed up as follows :

Every bakehouse must be in such a state as to be on sanitary grounds fit for use or occupation.

The special sanitary regulations require that :—

- (1) A bakehouse must not contain or communicate directly with a water closet, earth closet, privy or ash-pit.
- (2) A cistern supplying water to a bakehouse must be separate from any cistern supplying water to a water closet.



- (3) A sewage pipe or drain must not have any opening in the bakehouse.
- (4) All inside walls and ceilings of rooms and all passages and staircases must be limewashed every six months, or coated with three coats of paint or varnish every seven years, and washed with hot water and soap every six months.
- (5) Places on the same level with a bakehouse and forming part of the same building, must not be used as sleeping places unless effectually separated from the bakehouse by a partition from floor to ceiling, and provided with an external glazed window of at least 9 superficial feet in area, of which  $4\frac{1}{2}$  feet must be made to open.

These regulations will in the case of all retail bakehouses be enforced by the Town Council. By the Act, I, as Medical Officer of Health, am given for the purpose, all the powers of entry, inspection, taking legal proceedings, and otherwise of a Factory Inspector.

Section 101 which deals with *Underground Bakehouses* has received the consideration of the Health Committee in respect of the four underground bakehouses which exist in the borough. The Act provides generally that no underground bakehouse shall be used as such unless it was so used on the 17th August, 1901, the date of the passing of the Act. Before the 1st of January, 1904, the Council must be satisfied that any underground bakehouse (whenever established) is suitable for the purpose in regard to construction, light, ventilation and all other respects, and give a certificate of suitability, or it will not be lawful to use such underground bakehouse.

The Incorporated Society of Medical Officers of Health has recently fully discussed this matter, and considered it desirable that the following suggestions should be adhered to so as to secure uniformity of action throughout the country. Generally speaking I am in accord with these suggestions—but special circumstances may render an inexorable adherence to every item both unnecessary and tyrannous.

To secure uniformity of action they should, in my opinion, be undoubtedly the chief basis of action as regards general principles and requirements, but a little elasticity must be allowed where a bakehouse is already well-ventilated and lighted, if for instance the height is not quite eight feet.

The suggested requirements for Underground Bakehouses are as follows :—

### **Suggested Requirements for Underground Bakehouses.**

#### **A. CONSTRUCTION.**

1. No underground bakehouse shall be less than 8 feet in height throughout, measured from the floor vertically to the ceiling ; and in case the floor area exceeds 300 square feet, such height shall be at least 8ft. 6ins.

2. No underground bakehouse shall have a cubic capacity, clear of the oven, of less than 1,500 feet.

3. The floor shall be constructed of hard, smooth, durable, and impervious material.

4. The walls shall be constructed of a material which is hard, smooth, durable, and impermeable to damp.

[*Note.*—Where adjacent ground abuts on a wall, or walls, such walls should be lined with the best glazed bricks, uniformly joined with Portland cement, to form internal walls, separated from the existing walls by a cavity, and bonded to them, the intervening space being ventilated to the outer air.]

5. The ceiling shall be even, impermeable to damp and dust, and durable.

6. Every underground bakehouse shall be approached by a suitable staircase, adequately lighted and ventilated.

No outside staircase shall terminate within an underground bakehouse.

Any opening into the shop above must be so covered as to prevent the entrance of dust.

**B. LIGHT.**

7. The underground bakehouse shall be adequately lighted with daylight throughout, to the satisfaction of the Sanitary Authority, and the lighting maintained shall be such that an Official Copy of the Abstract of the Factory Act may ordinarily be read in all parts of such bakehouse, between the hours of 11 a.m. and 3 p.m.

**C. VENTILATION.**

8. Ventilation should be so arranged that the circulation of air is confined to the underground bakehouse.

9. Ventilation shall be adequate, that is to say, fresh clean air shall be supplied constantly during working hours, so as to provide not less than 3000 cubic feet of air, per hour, for each person employed, with any additional amount required for purposes of combustion, in such a manner as to avoid the occurrence of draught, and so that the air is sufficiently renewed in all parts of the underground bakehouse ; and, by the aid of mechanical power, where in the opinion of the Medical Officer of Health, such is necessary.

Provision shall be made for the removal of steam from the underground bakehouse.

Where mechanical power is used, the fresh air shall be taken from a height above the level of the adjoining ground of not less than six feet, and be distributed to different parts of the underground bakehouse in such a manner as to change the air of such bakehouse in all parts.

[*Note.*—This will generally require the provision of a fan. Foul air may also be extracted by means of a fan with any aid available from gas and ventilating shafts.]

10. Arrangements for ventilation shall be such that the temperature of the underground bakehouse from October 1st to May 31st shall not exceed 80° Fahr., except within half-an-hour after a batch of bread has been drawn.



**D. ALL OTHER RESPECTS.**

11. Proper provision shall be made for the storage of flour elsewhere than in the underground bakehouse itself.

12. There shall be no opening into the underground bakehouse, for any purpose which will tend unduly to the admission of dust from the adjoining street.

13. Conveniences for personal ablution shall be provided in a suitable position, and shall include a water tap, and a sink or lavatory basin of an approved character.

[*Note.*—These conveniences should be outside the underground bakehouse.

Free access shall be provided to suitable sanitary conveniences suitably situated.

14. All troughs, tables or other furniture standing on the floor of the underground bakehouse shall be provided with strong ball-bearing castors.

15. Proper provision shall be made for the depositing of wearing apparel outside the underground bakehouse.

16. An underground bakehouse shall not be in communication with a wash-house, nor with any room, cellar or area containing objectionable materials.

17. An underground room, not entirely separated from the underground bakehouse, shall be well lighted throughout, shall be sufficiently protected against the entrance of ground air, shall be properly ventilated, and shall be at all times clean.

18. All statutory obligations shall be fulfilled.

19. Before making any alterations with a view to meeting these requirements, the owners or occupiers of underground bakehouses shall submit to the Sanitary Authority a specification (and plans) of the alterations which they propose making.

*[Adopted by the Incorporated Society of Medical Officers of Health on November 21st, 1902.]*

As to the four underground bakehouses in the Borough I have advised the Health Committee to recommend the Council to refuse certification of one as being incapable of reconstruction to satisfy the Statutory requirements. The other three will doubtless be certified, providing certain requirements are fulfilled before the end of the current year. The matter is still under the consideration of the Health Committee.

A tabular statement is appended of the work carried on in Southend during 1902 under the Factory and Workshop Act, 1901. This statement is compiled from the Register which is duly posted up shewing in each instance the situation and nature of the business, the name of the occupier, the number of workrooms and of hands employed, the dimensions of each room, and the number of workers allowed; the general conditions of each room with notes as to means of ventilation and warming; the position and ventilation of gas fittings; notes on w.c. accommodation, fixing of abstracts, and of dates of visits with remarks.

The Administration of the Act has involved much time and labour in visits of inspection, measurements, entries in the Register, etc. It has not been found necessary during 1902 to serve any formal notices of abatement or institute any legal proceedings under the Act.

### **Domestic Workshops.**

There are four of these on the Register. By "domestic workshop" is meant a workshop in which "no mechanical power is used and in which the only persons employed are members of the same family dwelling there." Workshops where the work is only done at irregular intervals, and does not furnish the whole or the principal means of living to the family, and also workshops in which the only work done is straw plaiting, pillow-lace making and glove making are specially excepted by the Act.

### **Factory and Workshop Act, 1901.**

*Report of the Medical Officer of Health on the Administration of the Act in the Borough of Southend-on-Sea during the year 1902.*

No. of Workshops on Register...	...	...	...	66
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Laundries	...	...	...	...	6
Domestic Workshops	...	...	...	...	4
Bakehouses	...	...	...	...	30
Other Workshops	...	...	...	...	26
					<hr/> 66 <hr/>

Total Inspections under the Act	{ By Medical Officer of Health By Sanitary Inspector				30
					437
No. of Factories under Inspector of Home Office	...				33
Circular letters sent by Medical Officer of Health to Employers of Labour re Outworkers...	...	...	...		32
Workrooms including bakehouses lime-whitened...	...				61
Communications received from Employers of Labour	...				10
Notices received from Home Office re new workshops	...				4
Nuisances detected by H.M. Inspector of Factories and reported to Medical Officer of Health	...	...			Nil
Information received from Medical Officers of other Districts re Outworkers in District	...	...	...		1
No. of Workshops measured as to cubic space, lighting, ventilation, and general sanitary condition...	...				60
No. of Workshops, plans prepared, showing position of workrooms, etc.	...	...	...	...	30

*The following Nuisances were abated under the Act.*

W.C. pans cleansed	...	...	...	...	6
Overcrowding abated, workrooms	...	...	...		4
Ash bins provided	...	...	...	...	2
Racks for women (working in washing rooms of laundries) to stand on	...	...	...	...	3
No. of young persons found working and not being entered on the General Register...	...	...	...		5
Since complied with ..	...	...	...	...	5
No. of workshops found not showing the Abstract fixed, but since complied with	...	...	...	...	25
Notices served to abate Nuisances	...	...	...		8
Defective flushing cisterns repaired in w.c.'s	...	...	...		2
Improved ventilation provided...	...	...	...		1
Lists of Outworkers received from Employers	...	...	...		2
No. of Outworkers	...	...	...	...	3



## **Slaughter Houses.**

Existing Slaughter Houses have been regularly inspected during the year. In June there was a complaint from several residents in Grover Road of a neighbouring slaughter-house as a nuisance, chiefly on account of the cries of the animals kept for slaughter. The Health Committee in consequence instructed the Town Clerk to communicate with the various butchers in the town re the provision of a PUBLIC ABATTOIR. In my monthly report for August, 1902, I again referred to this matter in the following terms. "I have reported on this matter more than once to the Health Committee. Given one centre for the slaughter of animals for food under direct municipal supervision, the systematic inspection of animals at the time of slaughter will be rendered possible. Such inspection is necessary to prevent the sale of diseased meat for human food. To ensure complete supervision it would be necessary, after a public abattoir is provided, to abolish private slaughter-houses," (see proceedings submitted to the Council Sept. 10th, p. 649). In September a deputation from the Southend-on-Sea and District Meat Traders' Association attended before and discussed with the Committee the question of the proposed provision of a public slaughter-house. The consideration of the matter was adjourned.

There are at present seven slaughter-houses registered in the Borough, the same number as in 1901.

## **Dairies, Cowsheds and Milkshops Order, 1885.**

During 1902 there were 31 milk premises on the register. 428 visits of inspection were made and 11 notices were served.

I have personally visited most of the premises already in use, and whenever a new application is made for registration I inspect the proposed premises. Advice as to structural alterations required and methods of ensuring cleanliness are generally readily welcomed. In two instances the premises were considered unsuitable. In a third, at Folly Farm, the water supply on the premises was a shallow well, which gave evidence of dangerous pollution. The use of this well was prohibited, and arrangements were made to secure a water supply from the Southend Waterworks Company, and the application was then approved. At Thorpe Hall Farm the water supply is from a

shallow well, which on chemical examination revealed a high proportion of nitrates and chlorides, but nitrites and free ammonia were not present. It was required that this water should invariably be boiled before using it for any dairy purposes.

### **Sale of Food and Drugs Act, 1875-1899.**

In February, 1902, the Town Council urged upon the County Council the importance of taking more samples during the summer months. In reply the County Council stated that twenty extra samples had been taken during each of the last two years, and that the number will be increased as circumstances require. Also stating that in two cases where prosecutions were instituted the Borough Bench did not convict. I commented on these latter cases in my last Annual Report.

I am indebted to Mr. Superintendent Simmonds for the following Return shewing the number of Samples submitted for Analysis during the year 1902.

No. of Samples.	Nature of Samples.	No. in which Proceedings were taken.	No. Convicted.	No. Dismissed.
30	New Milk ... ..	7	2	5
10	Butter ... ..	—	—	—
12	Bread ... ..	—	—	—
8	Gin ... ..	—	—	—

The following articles were condemned during the year by myself or the inspector, who periodically inspects the various shops and articles intended for food :—21lbs. of Pork, 26lbs. of Plums, 56lbs. of Apples, 7lbs. of Ham, 2 Kidneys, 3 Herrings.

## **New Buildings.**

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Bye-laws are enforced. No new house is permitted to be occupied without a certificate of habitation. In default proceedings are taken.

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## **Sewerage and Drainage.**

### **Prittlewell.**

In February, 1902, a piece of land was purchased for the site of a pumping station. In May the necessary notices with regard to easements were served, and in June a contract was entered into for the construction of new sewers, and for the erection of a pumping station and sewerage chamber in connection with the scheme. The work is now well in progress.

### **Extension of Leigh Road Sewer.**

In July the Town Council resolved to make application to the Local Government Board for sanction to the borrowing of £2,750 towards this scheme of extending the sewer from the Plough Inn to a point near Folly Farm. Plans are at present under the consideration of the Highways and Works Committee.

### **Extension of Western Valley Low Level Sewer.**

In June the Local Government Board approved of the scheme, at the same time making the suggestion that the storm overflow should be carried an additional 80 feet along the shore. This was agreed to by the Town Council.

### **Ditch rear of Hartington Road.**

A nuisance existing here, and the owners not being prepared to pay the cost of piping and filling in, the Corporation carried out the necessary work and abated the nuisance.



## **Public Conveniences—Western Esplanade & East Street, Prittlewell.**

The questions of site and designs for these are under the consideration of the Town Council and the Local Government Board.

## **New Sewer in Southchurch Beach Road.**

On February 6th, 1902, the sanction of the Local Government Board was obtained to the borrowing by the Town Council of £1039 towards this object, and the work has since been carried out. All the houses along the beach are now connected up with the new sewer.

## **Cesspools.**

In view of the necessity for at once dealing with cases of overflowing cesspools the Health Committee resolved in April, 1902, that as soon as any nuisance from overflowing cesspools exists, that notices be at once served upon the occupiers urging them to empty and cleanse the same, and that in default the same be emptied and cleansed by the Corporation, the expense to be recovered from the occupiers.

I regret to say that owing to new buildings being rapidly erected in parts of the borough at present unsewered, a considerable number of these sanitary abominations has been added during the year to those already existing.

## **Westcliff Park Estate.**

Having regard to the rapid development of this estate, the Highways and Works Committee have recently (January, 1903) ordered the preparation of plans, etc., for the extension westwards of the Prittlewell Sewerage Scheme, with a view to application being made to the Local Government Board for borrowing powers.

## **Sea View Estate.**

A tender for the proposed main sewer having now been accepted by the Council, the drainage of this estate will be put in hand as soon as possible. This will effectually remove the nuisances so frequently complained of from overflowing cesspools on this estate, more particularly the large cesspool known as Butt's.

## **Ultimate Sewage Disposal.**

As is well known the sewage outfall is situated about a mile from the shore and 600 yards east of the pier, the untreated sewage being discharged during the first four and a quarter hours of each ebb tide. In December I reported on the advisability of considering whether it might not be advantageous to treat the crude sewage before discharging it into the sea. In consequence the Town Council has decided that the matter shall be further investigated, and have sanctioned the expenditure of a sum not exceeding £50 for experimental observations by the Borough Engineer and myself.

## **Foreshore.**

In the early part of 1902 the Town Clerk and myself were instructed by the Health Committee to communicate with the Sanitary Authority of the Port of London with reference to the precautions taken to ensure that sludge boats bound for the Barrow Deep do not discharge their cargoes prior to arriving at that point. In reply it was stated that regular inspectors were employed, whose duties would include the reporting of any case they might observe of the premature discharge of the cargoes of sludge boats. The Town Clerk of the City of London also stated that effective arrangements had been made between the Thames Conservancy, Trinity House and the London County Council for the prevention of the discharge of the contents of sludge vessels at any point above the Barrow Deep. Under the regulations of the Thames Conservancy, the owners of the "hoppers" are required to furnish weekly returns of their freights, and each vessel passing the "Mouse" lightship is required to give a distinctive signal, and a return is made by the officer in charge of the lightship of the date and time when each hopper passes his ship both on the downward and upward journeys.

## **Southchurch Fishery.**

In reply to letters from Messrs. Baxter & Son, the Health Committee upon my advice stated that in their opinion it would not be advisable in the interests of the public health that the Foreshore should be re-used for fishery purposes under present circumstances.



## **Nuisance on Foreshore opposite Pier Shops.**

In August a nuisance was found existing here, and complaints were made. I investigated the matter, together with the chairman of the Health Committee, and the nuisance was abated. It arose partly from decomposing seaweed and partly from cockle and other shells stored in front of the shops. All these were removed.

## **Housing of the Working Classes.**

On the 12th February, 1902, the Town Council resolved to accept a tender for the erection of 40 houses for the working classes at the price of £8,969 5s. 0d. In June it was decided that some of the rooms of the houses should be enlarged, giving more floor space and cubic capacity.

For this and other reasons the original estimated cost has been exceeded, and in October the Council resolved to apply to the Local Government Board for a recommendation to the Public Works Loan Board to advance the sum of £10,000 for the purpose, at the same time requesting that the period for repayment be extended from 40 to 50 years.

The buildings are of brick with slated roofs. Ground air and damp are excluded by solid concrete beds and asphalt damp-courses. Two classes of houses are being constructed.

In class A the following accommodation is provided : on the ground-floor a parlour, 13 by 10 feet ; a kitchen, 13 by 10½ feet ; a small entrance porch ; a scullery, 10 by 8 feet, containing a copper, sink, and a bath. There is an outside w.c. at the rear. The living rooms on the first-floor are three in number, of the same dimensions as the rooms below ; and every bedroom contains a fireplace and air-bricks as well as window. Perhaps the most distinctive feature is the provision of a bath. These houses are to be let at 6s. 9d. per week. This may appear at first sight to be a somewhat heavy rental, but no similar accommodation can be obtained elsewhere in the Borough for less than 10s. or 11s. per week.

In class B the following accommodation is provided : on the ground-floor, a living-room, 13 by 11 feet ; a small entrance



porch ; a scullery, 13 by  $9\frac{1}{2}$  feet, containing copper, sink, and bath ; and an outside w.c. in the rear ; on the floor above are two bedrooms, 13 by 11 feet, and 13 by  $9\frac{1}{2}$  feet. These houses are to be let at 5s. 6d. per week. Even in these small houses provision is made for a bath. By the exercise of a little ingenuity and common sense the bath can be utilised, or the bath could easily be screened off by curtains. To preach the gospel of cleanliness, and not to provide sufficient means of cleanliness in the houses of the working classes, is obviously paradoxical, and, I hope, avoidable in the future. I think it is time that model bye-laws contained a clause requiring the provision of a bath in every newly-built house. Some critics object to the position of the bath in the artisan dwellings now being erected. In the smaller houses they will be placed almost under the scullery window. Whatever there may be in the objections, the obvious reply is that it is far preferable to have a bath with some disadvantages, than to have no bath at all.

### **Premises rear of Pleasant Row.**

These premises were under inspection and consideration, and notices were served on the owners or occupiers to carry out certain sanitary repairs to render them habitable. These were complied with in due course.

### **Bentall's Cottages on the Beach.**

Notices having been served on the owner specifying certain works, he replied stating that the cottages would soon be pulled down.

### **Hutley's Cottages, North Street, Prittlewell.**

In August I again reported these as so dangerous to health as to be unfit for human habitation, and proceedings were taken in November, under the provisions of the Housing of the Working Classes Act, 1890, with the result that a closing order was made, and the buildings have now been pulled down.

### **Common Lodging Houses.**

There are at present none in the Borough. In May attention was drawn to a house in East Street, Prittlewell, which

it was alleged was being used as a common lodging house, but it was found on investigation that it was used as a lodging house for workmen at a capital charge of 3s. a week.

### **House to House Inspection.**

In September I submitted a report on the matter, and the Town Council resolved to authorise the Health Committee to engage for a period of six months two additional Inspectors of Nuisances with a view to completing the house to house inspection of the Borough. They entered on their duties on November 10th, 1902, and by December 31st they had inspected 109 premises, and tested 79 drains, in addition to securing the remedying of minor defects.

### **Meteorological Instruments.**

A Fortin barometer, a sunshine recorder, wet and dry bulb hygrometer, maximum and minimum thermometers, rain guage, earth thermometer, wind anemometer, and solar radiation thermometer, together with a Stevenson's screen, have recently been acquired by the Council for meteorological observations.

### **Street Watering.**

In April the Borough Surveyor was instructed to communicate with the County Council Surveyor, asking that the Streets in the Borough under the control of the Essex County Council might be more efficiently watered. The frequent and thorough watering of streets is a most important sanitary measure in dry weather.

### **Disinfection.**

On February 18th, 1902, the Health Committee, on my initiative decided to purchase an Equifex Spray disinfector at a cost of eight guineas. By means of this Spray, disinfection with formalin solution has been employed in addition to disinfection as hitherto by means of S.O.<sub>3</sub> gas. It has proved useful in disinfecting certain articles which would have been ruined by the steam disinfector. Steam disinfection is, however, used wherever possible as the most trustworthy agent.



## **Disposal of the Dead.**

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### **St. John's Churchyard.**

This, of course, is a very important matter from a sanitary standpoint, and is one in which the experience of mankind is coeval with the existence of man. Experience teaches those who are disposed to learn, but too often the lessons which should be learnt are neglected or not even noticed. In this country until the passing of the First Burial Act in 1852, burial grounds were surcharged, and the entire space under certain churches converted into charnel chambers. Since then the practical results of legislation have brought about the discontinuance of burials within towns, and the closing of burial grounds as fast as they become full. In Southend the matter of St. John's Churchyard has been under observation and consideration for many years. In May, 1895, an Inspector of the Home Office held an inquiry as to the necessity for closing this churchyard as a burial ground, and reported that space remained for three or four years. In October, 1898, the Health Committee requisitioned the Home Office to again hold an inquiry. In November, 1898, Dr. Hoffman, of the Home Office, decided that the churchyard should be closed as a burying ground, but reserved a right of interment of members of the same families in existing graves having the necessary space.

In January, 1900, a communication was received by the Town Council to the effect that the authorities of St. John's Churchyard would act in accordance with Dr. Hoffman's report. Twice during the past year, however, it was discovered that interments were about to take place without the necessary space being available. On the second occasion the limits of space were so much overstepped as to necessitate the forbidding of the impending burial. The matter was brought before the Health Committee in September, and again on October 6th, 1902, when a letter from the vicar's warden was read stating that the churchwardens had no jurisdiction, the churchyard being the freehold of the late vicar. On December 16th the Health



Committee considered the facts of the action taken by the Town Clerk in connection with the second contravention of the regulations of the Home Secretary. The Committee were in favour of a Closing Order, excepting only such family graves where the necessary space was available for further interments. On January 6th, 1902, the Committee were informed that the question of the discontinuance of the burials in St. John's Churchyard had been transferred from the Home Department to the Local Government Board. On February 4th, 1903, Mr. M. K. North, an inspector of the Local Government Board, investigated the matter. At this inquiry a letter from the Rev. Monck Mason, the new vicar, was put in, assuring the Local Government Board that he would not sanction any *new* graves in the churchyard. What the Health Committee desires is that no interments should take place except in proper family vaults, where the necessary space exists, and that future interments in these shall take place only if the Home Office regulations are strictly complied with.

### **The Borough Cemetery.**

There were 174 interments during the year. The cemetery was opened for use in March, 1900. Since then 416 interments have taken place. The number of grave spaces which were available for interments, allowing 9ft. by 4ft. for each, was, at the opening of the cemetery, 3,286. The cemetery is situated in the Sutton Road, well away from the town. It is a matter worth consideration in the future whether this Borough shall not, under the provisions of an Act passed in July, 1902, establish a municipal crematorium. Whether dissolution of the body is brought about by fire or earth, it is in time resolved into its ultimate elements by either agency. The advantage of fire is that this dissolution is effected in a very short space of time without the disagreeable, and revolting stages of corruption. Further, in cases of death from infectious diseases, any dangerous disease germs about the cadaver are immediately destroyed. In England and Scotland there are at present six established crematoria, viz., at Woking, Manchester, Glasgow, Liverpool, Hull, and Darlington. The Corporation of London intend erecting another at Ilford. Another crematorium for London has been erected at Hampstead, and the St. Pancras Borough Council has a scheme in hand. Among provincial towns Leicester has decided to have one, and Bradford is considering the

matter. There are so many scientific and sanitary arguments in favour of cremation, that this method of disposal of the dead will, I venture to think, in time become more universal. When it has become the custom nothing but wonder will be expressed that it took so long to become established. There will then no longer be occasion for closing graveyards, nor for wounding susceptible feelings by stopping a burial on the score of sanitation. Such strict enquiry is made before cremation of a body is carried out, that it becomes impossible for a body which has been the subject of foul play to be cremated. The risk of murder being rendered untraceable by cremation would be quite negligible.

## Schools and Infectious Diseases.

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In my last Annual Report I gave particulars of the means which proved successful in extinguishing a small outbreak of diphtheria in January, 1902, in connection with the Infants' Department of the Brewery Road schools. A large proportion of the 11 cases of diphtheria notified during March, 1902, occurred among children attending the Infants' Department of the *London Road Board Schools*, and also the *Gospel Hall Sunday Schools*. I advised the closure of the Infants' Department of the Board School for a fortnight by extending the Easter holidays, and of the Gospel Hall Sunday School for two Sundays. In the meantime each school was disinfected. The result was eminently satisfactory and completely arrested the spread of the disease in the schools. For about a month from this date the Borough was free of diphtheria. Then an extraordinary outburst occurred. On the 22nd and 23rd April no less than six notifications were made in two days, in different parts of the Borough, with nothing in common except in two cases. Two of the cases were imported into the Borough.

In my Special Report I show the connection between the majority of cases which occurred during July and August, and the Brewery Road Schools, the infection of a considerable number of children attending these schools having simultaneously occurred a day or two before the schools closed for the summer vacation (*vide* Special Report). Of the cases occurring in August, three were definitely imported; 18 secondary cases occurred in houses already infected; in most of these two or three notifications were made simultaneously or within a day or two of each other. Advantage was taken of the summer recess to thoroughly disinfect and cleanse the schools. Among other preventive measures I urged on the Council:

- (1.) The more frequent cleansing and watering of streets and flushing of gullies,
- (2.) The frequent removal and efficient destruction of trade and other refuse.



The provision of a Refuse Destructor as pointed out elsewhere is engaging the attention of the Council. In December, I again reported that I was inclined to attribute the first cases of diphtheria in a large measure to our present insufficient methods of refuse disposal, secondary cases generally occurring from contact at school. In December, there was again a small but distinct outbreak in connection with the Infants' Department of the Brewery Road Schools. I personally inspected every child in the Infants' Department, and by excluding a few suspicious looking children, as well as all children from infected houses, the outbreak was effectually controlled without having to resort to school closure.

In my report for 1901, I recorded certain "Household Hints for the prevention of disease," which were printed by order of the Health Committee for free distribution. These were left at all houses where cases of infectious disease occurred, as well as at adjoining premises. In addition, I obtained the consent of the Health Committee to publish the following memorandum :

SOUTHEND-ON-SEA,

*August 12th, 1902.*

The Health Committee desire to call your special attention to the accompanying pamphlet of "Household Hints" for the prevention of Diphtheria and other diseases. Certain points of great importance are marked with an asterisk. If these precautions are honestly and strictly carried out the present small outbreak of Diphtheria and Scarlet Fever will soon be checked.

N.B.—Do not forget that any child which seems poorly should be kept away from all other children in a separate room. If this is impracticable it should at any rate be kept in a separate bed, and not allowed to play with or be nursed by other children.

#### HOW TO RECOGNISE DIPHTHERIA.

The early symptoms are often very slight, a child may appear pale and languid only or simply disinclined to play or eat. If a child seems a little poorly get it to open its mouth and look inside

its throat for little white specks or patches at the back of the throat. If these are to be seen, or if a thin discharge is coming from the nose, the child probably has Diphtheria and requires immediate Medical advice.

The early recognition and treatment of Diphtheria means everything to the child, and will enable proper measures to be taken to prevent the disease spreading to others.

Parents should always wash their hands well after touching a sick child, so as not to carry any possible infection to their other children. A sick child should not be kissed on the mouth.

### THE LAW ABOUT INFECTIOUS DISEASES.

1. All such cases must be reported at once to the Medical Officer of Health, at the Health Department, Clarence Road. Failure to report makes the responsible person liable to a penalty of Forty Shillings. Cases must be reported by parents or guardians, whether a doctor is in attendance or not.
2. Any person who while suffering from any dangerous infectious disorder exposes himself wilfully without proper precaution against spreading such disorder in any public place, or being in charge of a sufferer so exposed, or who gives, lends, sells, transmits, or exposes infected articles whether bedding, clothing, or rags, or who lets a house or part of a house in which infection has been, unless it and contents have been satisfactorily disinfected, is liable to a penalty.

The Sanitary Committee will make an example of any person discovered infringing the laws relating to infectious diseases.

(By order) J. T. C. NASH, M.D., M.S., D.P.H.,  
*Medical Officer of Health.*

Report at once to the Health Department any choked drain, or other nuisance which may occur in your neighbourhood.

Hints to teachers were sent round to the various schools as follows :—

### HINTS TO TEACHERS.

1. Any child who has a sore throat should be considered infectious and sent home, and not permitted to return to school until certified by a doctor as non-infectious.
2. Any child shewing signs of a heavy cold such as snuffling, sneezing, running at the nose, and redness of the eyes, should be sent home and not re-admitted without a doctor's certificate.
3. Any child with a rash, especially if hot and feverish at the same time, should be sent home, and not permitted to return to school without a medical certificate.
4. Any child whose skin appears to be "peeling" should be sent home, as a possibly overlooked case of scarlet fever.

#### IF PROMPTLY ACTED UPON.

Hint (1) May save an outbreak of diphtheria or scarlet fever.

Hint (2) May save an outbreak of diphtheria or measles or influenza.

Hint (3) May save an outbreak of measles, scarlet fever, &c.

If whooping cough is prevalent any child who has a severe prolonged cough, especially if accompanied with vomiting should be sent home as suspicious.

The Medical Officer of Health will be glad to have immediate information of any such cases so dealt with.

Whenever I receive a notification of infectious disease in a house where any children are attending school I inform the head teacher on a printed form requiring that no child shall be received from such house until a certificate be sent permitting re-attendance. I supply the householder with another form to show the School Attendance Officer that it is by my orders that the children are not to attend school.



## **Other Diseases.**

No school closure was required for scarlet fever, with the exception of a small private school, where two or three cases of scarlet fever occurred among day scholars, and a resident boy was found to be "peeling," and removed to hospital. The school was closed for 14 days, and meanwhile disinfected.

Chicken pox was rife during the year, and considerably interfered with the average school attendances.

## **Small-Pox.**

A case of small-pox occurred in April in the person of an unvaccinated girl attending the National School, St. John's, and another in an unvaccinated girl attending the Brewery Road Schools. General revaccination was carried out and the schools closed for two days to allow of disinfection. No further case occurred among the scholars in either instance.

## **General Remarks.**

I visited on several occasions the different Board Schools and the National Schools (St. John's) during the year, and advised the School Board on various sanitary measures and made suggestions for improvements. Among other suggestions I advised that the lavatory basins should be trapped. In a private school where sore throats were frequent my advice was sought, and finding the lavatory basins untrapped I suggested this measure, and am informed that no further cases of sore throat have occurred since.

The arrangement of informing teachers of cases of infectious disease occurring in the homes of scholars, and requiring them not to permit the attendance of any children from infected houses has worked well. I have also received assistance from the teachers, who send me lists of absentees on printed forms. By means of this method of notification I was enabled to early detect a case of small-pox in the person of an unvaccinated girl aged 11, who was reported to the schoolmistress as having "measles." Three or four cases of "sore throat" have proved to be diphtheria, and of "eczema" to be scabies.

## Water Supply.

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In September, 1901, I laid a special report before the Council on the water supplied by the Southend Waterworks Company. It will be remembered that in September, 1901, some daphnia were found in the water issuing from the taps. I traced these animalculæ to an uncovered reservoir at Thundersley.

The history of the Southend water supply and particulars of wells in use up to that date will be found in my annual report for 1901.

During 1902 a new well was sunk at Fobbing, but is not yet completed. Its method of construction is being carried out on the same lines as the wells already in use. When the well was being sunk, during the summer, a water bearing stratum in the Lower London Tertiary Deposits was tapped. A chemical analysis revealed that this water was of high purity, organic nitrogen and organic carbon being absent, but in marked contrast to the water derived from the chalk reservoirs at a greater depth, the hardness figures high. This water was added to the Borough supply from June to November.

The increase of hardness, due to the addition of this water to the water supply of the Borough, was detected by me in my usual monthly examination of tap water in June. I communicated with Mr. C. S. Bilham, the manager of the Water Works Company, who courteously gave me every information. In September, 1902, I visited the new well at Fobbing in company with Mr. Bilham. The following is the result of analysis of the water derived from the Lower Tertiary Deposits:—

					Per Gallon in Grains.
Total solids in solution	...	...	...	...	90.65
Chlorine	...	...	...	...	11.90
Nitrates	...	...	...	...	nil
Free Ammonia	...	...	...	...	0.117
Organic Ammonia	...	...	...	...	0.001
Organic Carbon	...	...	...	...	nil
Organic Nitrogen	...	...	...	...	nil
Oxygen absorbed in 4 hours	...	...	...	...	0.053
Lime	...	...	...	...	11.72
Magnesia	...	...	...	...	9.49
Sulphuric Anhydride	...	...	...	...	27.7
Hardness before boiling	...	...	...	...	56
„ after „	...	...	...	...	41.3

In accordance with the recommendations I made in my special report, the Water Works Company have covered over at great expense their open reservoirs at Thundersley and Oakwood. I have inspected these works since their completion, and found them very satisfactory.

One or two complaints in the Westcliff district, in May, were found to be due to repairs and fresh connections being carried out in the neighbourhood. The discolouration complained of being only of a few hours duration.

The water supply from the Company's mains was examined by me at the Borough Laboratory sixteen times during 1902, and has been found satisfactory. In June there was an increase in the amount of hardness and of free ammonia, but this is explained by the introduction of the Fobbing supply.

It was suggested at a recent trial (the Jacob case) that the Southend water supply has a dissolving action upon lead. There is not the slightest evidence of such action. On the contrary it contains certain mineral matters, such as silica, &c., which prevent action, not only by forming a coating on the pipes, but by their simple presence in the water. I have specially tested for the presence of lead on several occasions, but have never found a trace of that metal, nor have



I heard of any analysis of the Southend Water Works Company's supply revealing the presence of lead ; nor do I hear of any cases of lead poisoning in the district. The statement was absurd. We are fortunate in having, in Southend, a water supply of great purity, both chemically and bacteriologically.

The following analysis is typical of the results obtained :—

				Per Gallon in Grains.
Total dissolved matter	...	...	...	60.00
Free Ammonia	...	...	...	.001
Albuminoid Ammonia	...	...	...	.002
Chlorine	...	...	...	22.10
Nitrates	...	...	...	Inappreciable
Nitrites	...	...	...	nil
Hardness	...	...	...	2.0
Oxygen absorbed in 4 hours	...	...	...	.023

While the Fobbing supply was being added the hardness increased to 6 grains per gallon.

### **Water Supply at Folly Farm.**

A shallow well had been in use for some years, but the inmates of the farm had always boiled the water before using it. The wisdom of having done so was shown by an analysis I carried out, which revealed the presence of nitrites, excess of chlorides and of free ammonia and albuminoid ammonia, while bacteriological examination revealed a large excess of bacteria.

I condemned the water as impure and unpotable, and the farm has since been supplied by the Water Works Company.

### **Thorpe Hall Farm Supply.**

In consequence of the occurrence of typhoid fever this water was also examined. The source of supply is a shallow well situated about 20 yards from a large cowshed, and about 100 yards from a midden privy. This water contained an excess of nitrates and chlorides, and I directed that it should not be used for drinking or dairy purposes

unless previously boiled. As dairy interests were concerned, I submitted a sample of water taken in the presence of Mr. Hutley to Dr. Dyer, whose results and conclusions confirmed my own. A further sample was taken by the owner's agent for independent analysis. I wrote to ask for the results of this analysis, which, however, were not submitted to me, a default which goes to show that the analyses made by Dr. Dyer and myself had received further confirmation.

## Borough Sanatorium.

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### Provision of Isolation Hospital Accommodation.

In my Annual Report for 1901 I commented on the urgent need for the enlargement of the Borough Fever Hospital. I pointed out the difficulty that would arise in administration if cases of typhoid fever, scarlet fever, and diphtheria had to be treated at the same time. More particularly in the event of a mixed infection occurring, such as the admission of a patient suffering from concurrent attacks of scarlet fever and diphtheria, or in the event of measles or whooping cough or chicken pox becoming manifest after admission into a ward.

I further pointed out that by reason of the rapid growth of the Borough the number of notifications of infectious diseases was likely to increase. Further I argued that every year we would have a larger number of susceptible children attending schools ; and finally that the percentage of admissions to hospital was increasing year by year, so that whereas in 1896 only 43·5 per cent. of notified cases were admitted to hospital, in 1900 and 1901 over 70 per cent. sought admission. These facts I argued indicated the *urgency* of increasing the accommodation. Southend being a health resort it appears advisable to provide even further special accommodation in the shape of private wards off the main wards for persons willing to pay for such accommodation. If not required for this purpose such small wards would be useful for the isolation of delirious patients, etc.

*Number of Beds required according to population.*—A rough estimate of one bed for every 1000 inhabitants is a common standard, but in a place like Southend, which for many months of the year has a large floating population of visitors, this estimate is hardly sufficient, and a larger proportion of beds should be provided. This is the more essential as most persons have come to appreciate the benefits of the sanatorium, and the percentage of demands for hospital accommodation has become so high. I think a rough estimate of one bed for every 800



inhabitants would give a proper proportion of beds. This means the provision of 40 beds for present needs, but to provide for contingencies in the near future, steps should be taken, in my opinion, to ensure within the next year or two at least 50 beds.

Plans for further accommodation should provide for :—

- (1) An isolation block with small wards to accommodate six persons.
  - (2) A ward pavilion for the accommodation of six persons of either sex, or 12 persons in all, with two small wards abutting for one patient each.
  - (3) Enlargement of the present administrative block to make suitable provision for the nursing staff.
- [Pending this provision an outside house is rented and a caretaker provided at a considerable expense. This expense will be saved when the administration block is enlarged.]
- (4) A laundry, the present provision being insufficient.
  - (5) A porter's lodge.

In my monthly report for July I alluded again to the pressing need for further accommodation. This became acutely evident during August, when, concurrently with an outbreak of typhoid fever, we had to deal with a serious development of diphtheria. Our accommodation was strained, and administration on satisfactory lines rendered very difficult.

In September last, having in view the usual autumnal incidence of scarlet fever, and the hospital accommodation already strained, I reported as to the immediate necessity for providing additional ward accommodation, and the matter was brought before a special meeting of the Council on September 3rd, when it was resolved that if it were not found practicable to hire a temporary building, the Health Committee should purchase a wood and corrugated iron building for the provision of from eight to twelve additional beds. On September 16th the Health Committee accepted a tender for the erection of a tem-

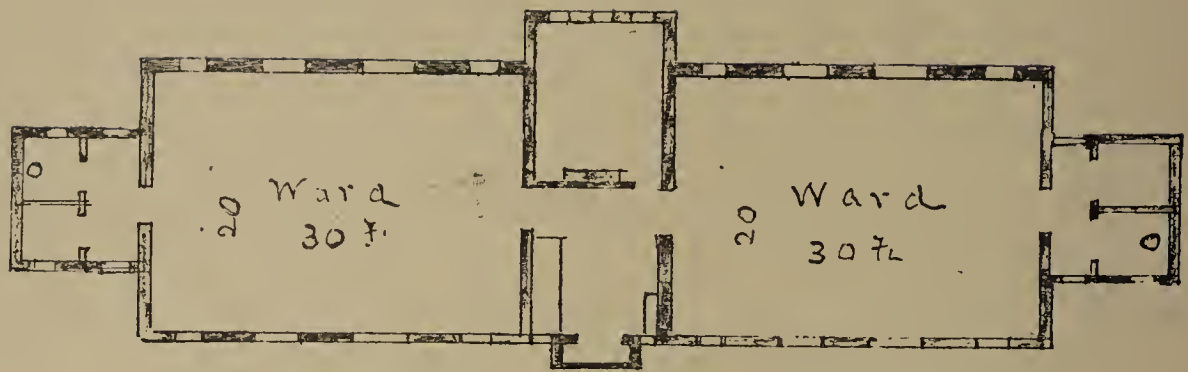
porary hospital pavilion for the accommodation of twelve beds at a cost of £325. The work was immediately put in hand, and the new pavilion was ready for use a couple of months later. The increased accommodation has proved a great boon.

On November 25th I again reported on the necessity of increasing the accommodation in the administrative block, and it was resolved that the Borough Surveyor, Mr. Elford, C.E., in consultation with the chairman and myself, be instructed to prepare plans, &c., for this purpose, and also for the provision of further hospital accommodation. These plans are in course of preparation at the present time. An outline ground plan of the new wood and iron block and the older blocks is inserted in this report for convenience of reference. They were kindly prepared for me by Mr. Whur at my suggestion.

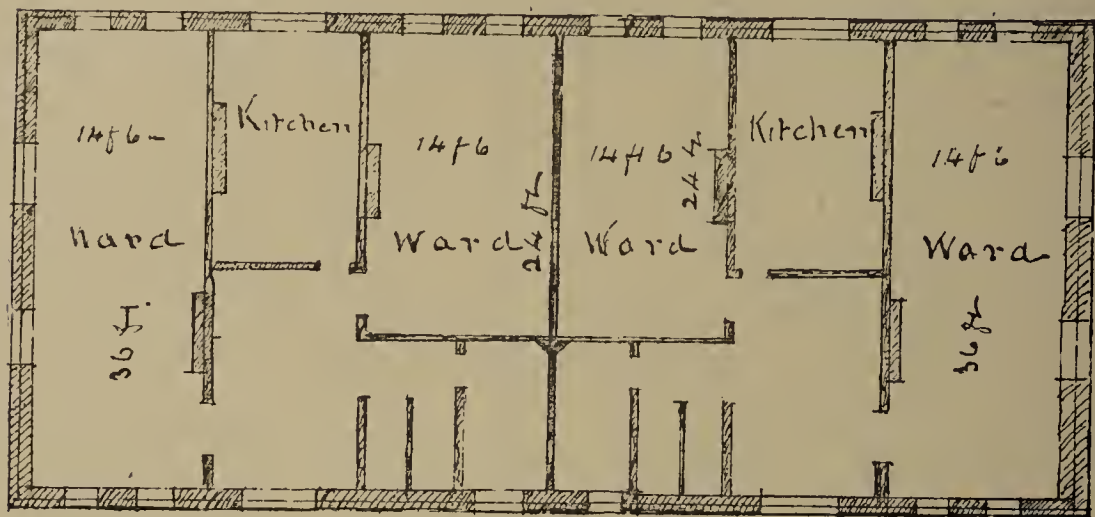
During 1902 no less than 266 patients were admitted into the Sanatorium, an increase of 100 persons as compared with 1901. These figures do not include cases admitted into the Small Pox Hospital. The following table gives a summary of patients treated in the Borough Sanatorium during 1902.

Diseases.	Remaining in the Sanatorium Dec. 31st, 1901.	Admitted during 1902.	Total Number treated in 1902.	Number discharged in 1902.	Number dying in in 1902.	Remaining in the Sanatorium Dec. 31st, 1902.
Scarlet Fever ...	20	88	108	92	1	15
Diphtheria ...	12	112	124	102	11	11
Typhoid Fever ...	4	66	70	62	7	1
TOTALS ...	36	266	302	256	19	27

The average stay of each patient in hospital was  $35\frac{1}{2}$  days as compared with  $43\frac{1}{2}$  days in 1901.



Sanatorium Block A, 1893.



Sanatorium Block B, 1896.



Sanatorium Block C, 1902.

W.W. del

The Diagrams merely show the arrangements and sizes of each Ward but not their relative positions.



The strain on the hospital accommodation, and the heavy anxiety that fell to my lot from an administrative point of view, will be better appreciated by the following table, which shews the number of patients admitted to the Sanatorium each year during the past five years :—

	1898	1899	1900	1901	1902
Patients attended by Medical Supt.	87	93	73	95*	173
"    "    other Doctors	68	56	89	78	93
TOTALS     ...     ...	155	149	162	173	266

\* Including 7 Staff.

The next table shows the number of cases of each disease treated in the Sanatorium for the past five years :—

Disease.	1898		1899		1900		1901		1902	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Scarlet Fever     ...     ...     ...	77	3	113	1	107	1	106	3	108	1
Diphtheria     ...     ...     ...	23	2	4	0	10	1	54	3	118	11
Typhoid Fever     ...     ...     ...	54	12	32	6	44	5	45	7	67	6
Other Diseases     ...     ...     ...	2	0	0	0	1	1	1	1	9†	1
	156	17	149	7	162	8	206	14	302	19

† These cases were admitted on notification as cases of one or other of the chief diseases, but further observation in hospital led to a revision of the diagnosis. If referred back to the diseases they were admitted as, the totals would read 124 cases of Diphtheria, with 11 deaths, and 70 cases of Typhoid Fever, with 7 deaths.

Whereas an unprecedented number of patients were under treatment during the year, it is satisfactory to be able to record a low death-rate for each disease.

In the following table the percentage of deaths from each disease in the Borough Sanatorium since 1898 is calculated according to the method of the Registrar General as follows: the admissions, discharges, and deaths are added together; this total is divided by two, and the percentages are calculated on this quotient:—

TABLE SHEWING PERCENTAGE MORTALITY FOR EACH DISEASE.

	1898	1899	1900	1901	1902
Total Case Rate ...	(162) 11·41	(166) 4·66	(177) 5·24	(207) 8 11	(302) 7·02
Scarlet Fever ...	(81) 4·11	(125) ·88	(120) ·99	(106) 3·58	(108) 1·10
Diphtheria ...	(23) 9·30	(4) ·00	(10) 10·00	(54) 6·25	(124) 10·04
Typhoid Fever ...	(56) 20·9	(37) 17·9	(40) 12·9	(45) 17·72	(70) 9·09
Other Diseases ..	(2) 50·0	—	(1) 100·0	(1) 0·0	(9) 11·11

NOTE.—The figures in parenthesis show the total number under treatment for each disease. The larger the number the relatively more trustworthy are the percentages.

The Typhoid Fever death-rate is exceptionally low, and forms a record for the Sanatorium. The Diphtheria death-rate is also satisfactory, considering the large number of cases which were under treatment, and is a striking testimony to the value of Antitoxin in this disease. Of the 11 deaths which occurred among the 124 notified cases of Diphtheria under treatment at the Sanatorium during the year, two were due to a mixed infection—the double infection in each case proving inimical to recovery. Of the remaining 9 deaths, one occurred in the ambulance before the child could be admitted to the wards, and the other died of toxæmia within a few hours of admission. These two cases were admitted too late for any treatment. The remaining 7 deaths all occurred among children who were not admitted until the later stages of the disease, at which stages Antitoxin is of limited use. Energetic treatment, however, undoubtedly prolonged life even in these fatal cases, whilst several other cases which on admission seemed almost past hope, happily responded to treatment and recovered. Excluding the 2 moribund cases and the 2 mixed infection cases, the case-rate from diphtheria was only 6·14 per cent. of the cases that actually received treatment.

The number of nurses during the year varied from 6 to 12, and of servants from 6 to 7.

It has been the practice since the Sanatorium was opened to make varying small charges for each person admitted to the Hospital. The sums have varied from 1s. 6d. to £1 1s. a week.

The Health Committee have lately been considering the matter, and have decided to continue the present arrangement.

Hitherto no record has been made in the Annual Report as to Expenditure at the Sanatorium. It seems advisable to have such a record. For some of the items in the following table I am indebted to the Statement of Accounts by Mr. Tweedale, the Borough Accountant :—

TABLE SHEWING COST OF ADMINISTRATION AT SANATORIUM AND SMALL POX HOSPITALS DURING THE YEAR ENDING MARCH 31ST, 1902.

		£	s.	d.
Structural Expenses, chiefly new Small Pox Hospital		416	0	0
Establishment and Patients, Expenses ...	...	2,100	0	0
No. of Patients treated during year	Sanatorium.	Small Pox Hospital.	TOTAL.	
ending March 31st, 1902 ...	195	8	203	
Average total cost for each Patient, including all the Working Expenses ...	...	...	10	6 10½
Average stay of each Patient in Hospital—6½ weeks.				
Weekly cost for each Patient, including all expenses			1	10 9

This amount is reduced by about 2s. 6d. a week, which is the average charge made for maintenance.

The boundary wall to the additional two acres of land recently acquired, was erected at a cost of £513 17s. 6d.

In August, 1902, the question of the efficiency of the appliances for use in case of fire at the Sanatorium was before the Health Committee, and it was resolved at the next meeting of the Council to apply to the Local Government Board for sanction to the borrowing of £125 for the provision of water mains, hydrants, and fire appliances for use at the Sanatorium.



**Establishment Expenses.**

The County Council in 1902 decided to make an annual contribution of not exceeding £10 per bed (the number of beds to be reckoned on a standard of air space of not less than 2,000 cubic feet per bed) towards the Establishment Expenses of Isolation Hospitals, subject to certain conditions.

The Health Committee discussed the advisability of applying for such grant, and finally decided to make application to the County Council for the grant, upon the understanding that the Hospital District should be exclusively confined to the Borough, and that a copy of the Audited Accounts should be sufficient for inspection by the County Council.

## The Borough Laboratory.

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The work done in this department has proved of great value to the Borough, and has been much appreciated, as will be seen by the following comparative figures for 1901 and 1902 of specimens submitted for bacteriological investigation by local doctors:—

For Examination in Cases of Suspected	No. of Specimens. 1901 1902		RESULTS.					
			Positive.		Negative.		Doubtful.	
			1901	1902	1901	1902	1901	1902
Diphtheria... ..	76	252	25	83	30	146	21	23
Typhoid Fever ... ..	7	59	5	38	1	19	1	2
Consumption of the Lungs	4	24	2	5	2	19	—	—
TOTALS ...	87	335	32	126	33	184	22	25

Thus in no less than 310 cases during 1902 earlier precision of diagnosis was attained than could be possible without the assistance of a Municipal Laboratory, and enabled prompt action to be taken administratively in connection with no less than 126 cases of infectious disease—thus minimising the risk of infection spreading.

I explained in my last Annual Report that one of the principal uses and advantages of the Laboratory was in connection with hospital administration.

A certain number of patients notified as scarlet fever are found on admission to hospital to harbour in their throats and noses diphtheria germs. I therefore make it a routine measure to examine swabs taken from the throats and noses of every scarlet fever patient *at the time of admission*. In this way much mischief is averted, and I need only refer to the hospital statistics, and to my remarks on scarlet fever and diphtheria, as already recorded in this report, to demonstrate

the value of bacterioscopic examinations in this connection. In 1902, among 88 patients admitted as scarlet fever, the diphtheria bacillus was found in two cases, as compared with four cases out of 78 admissions of scarlet fever in 1901

Further examinations are made of in-patients from time to time, and invariably before discharge from hospital; so that no patient is discharged from the Sanatorium as long as the diphtheria bacillus can be found on bacteriological examination. In some instances a swab may be taken several times from one particular patient before he is found to be free of diphtheria germs. The following table gives the results of bacteriological examinations of in-patients during 1902.

	No. of Exams.	No. of times Diphtheria bacilli found.	
Examinations for diphtheria bacilli			
among diphtheria patients	329	167	
Scarlet fever patients	102	5	
		Positive.	Negative.
Examinations for widal reaction			
among patients admitted as			
suffering from typhoid fever	50	47	3
	<hr/> 481		

Altogether no less than 481 examinations were undertaken in connection with hospital administration during 1902. These added to the 335 examinations of outside specimens submitted, make a total of 816 examinations during the year, as compared with 272 in 1901, and only 6 in 1900. These figures indicate what an increasing share of my time has to be given to laboratory work in connection with infectious diseases.

## Water Examinations.

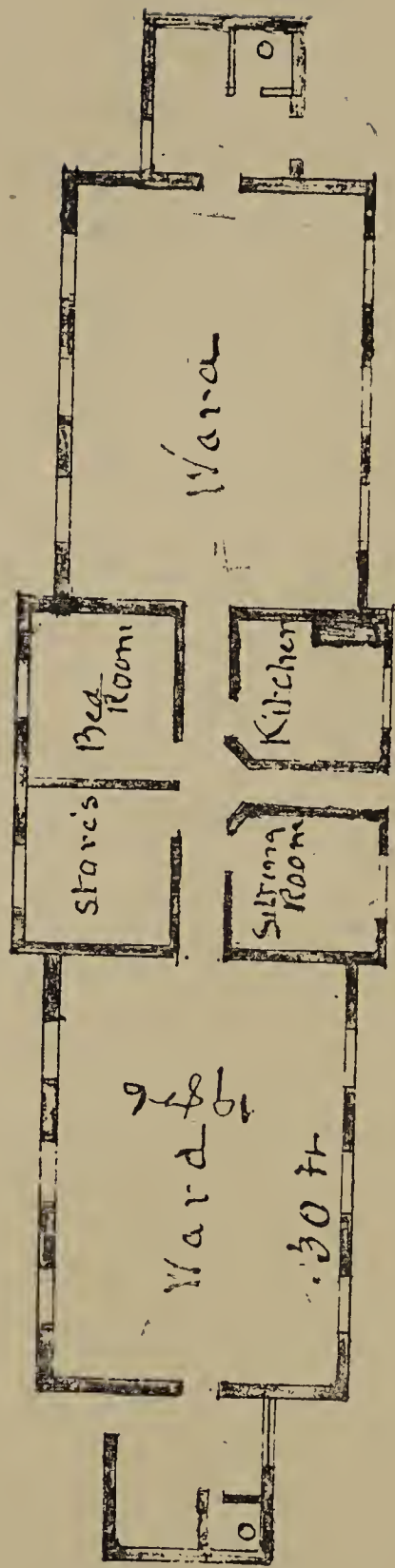
Water from the Southend Water Works Company's mains was examined by myself 16 times during the year, both chemically and bacteriologically. In addition four other samples of water from three wells and a cistern were examined by me in the Borough Laboratory.



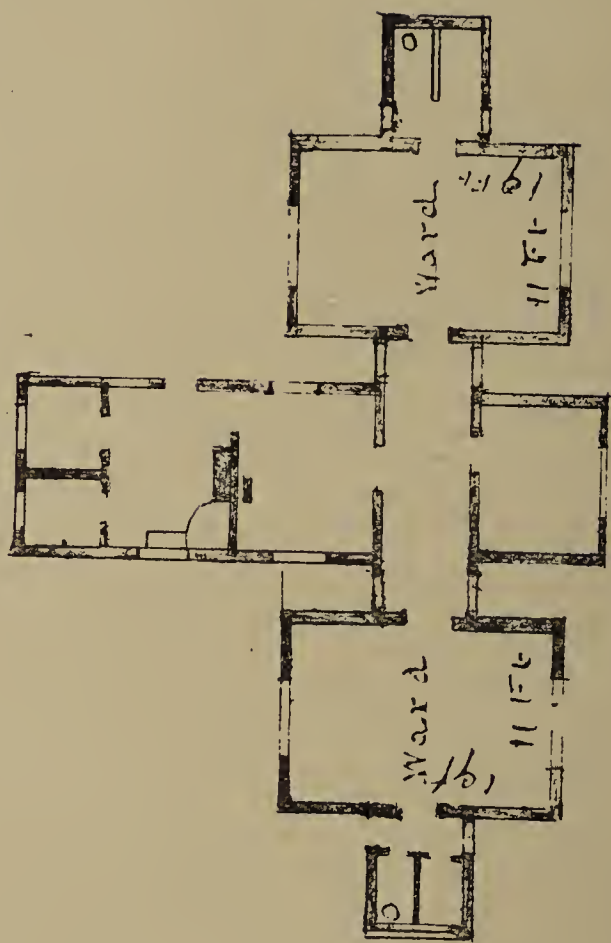
## Small Pox Hospital.

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On February 12th, 1902, the Town Council authorised the expenditure of £290 for a further temporary Smallpox Hospital, and empowered the Health Committee to take any steps they might consider necessary, and to incur any such expenditure as might be necessary in order to deal with any cases that might arise, and to prevent the spread of the disease. Accordingly a contract was entered into with Wm. Harbrow, for the erection in Sutton Road of a wood and iron building, particulars of which are as follows:—two rectangular wards were provided of the following dimensions each, 29ft. 10in. by 19ft. 5in. by 13ft., giving ample accommodation for four beds in each ward. The hospital previously in existence in the grounds is a wood and iron structure, containing two wards of the following dimensions each 19ft. 2in. by 11ft. by 13ft. For administration purposes each block has a kitchen with a brick flue provided for the kitchener. In the new block a scullery sink is placed in the kitchen. Three other small rooms are provided in this block, one of which contains a bath. In the old block besides the kitchen there is a nurses room, a scullery, larder and coal house. Earth closets are provided for each ward—the excreta being well mixed with lime or carbolised sawdust and buried or burned. Early in 1902, provision was made for extra storage for coals, and for other stores; also for sanitary conveniences for nurses, and a crematorium for infectious material. Recently, an addition has been made to facilitate laundry work in connection with the hospital. The water supply is constant from the Southend Water Works Company's mains. The site of the hospital is a large field of about four acres on the confines of the Borough, and well away from other habitations. The population within half-a-mile does not exceed 100 persons. The waste water is carried to contact beds. There are no streams or wells anywhere near. No case of smallpox occurred in the vicinity of the hospital.



S. P. H. Sutton Road, May, 1902.



W. W. del.

S. P. H. Sutton Road, January, 1896.

The Diagrams merely show the arrangements and sizes of each Ward but not their relative positions.

In all 26 patients were treated in the smallpox hospital during 1902, 24 being admitted during the year, one occurring in the hospital, while one case remained who was admitted in December, 1901.

The percentage of deaths to cases should be stated (1) as a whole and (2) in relation to state of vaccination. Adopting the Registrar General's method of adding together discharges, admissions and deaths, dividing this by two, and calculating the percentages on the quotient, we find the case mortality as follows :—

(1) As a whole without differentiating between vaccinated and unvaccinated	...	...	...	19.60
(2) Persons vaccinated within 15 years (no cases)	...			0.0
(3) Persons vaccinated from 15 to 25 years ago (three cases, no deaths)	...	...	...	0.0
(4) Persons vaccinated from 25 to 65 years ago (11 cases, 1 death)	...	...	...	9.09
(5) Persons unvaccinated before exposure to infection (10 cases, 4 deaths)	...	...	...	40.00
(6) Person stated to have been previously revaccinated, but no evidence (1 case, no death)	...	..		0.00

I have elsewhere\* given fuller particulars of the cases of smallpox occurring in the Borough during 1902. The staff employed in addition to myself, consisted of a charge nurse, a junior nurse, two wardsmails, a laundress, and two male attendants, during the whole of the seven-and-a-half months the hospital was in use. All these (with the exception of one) were successfully revaccinated by myself, and remained quite well. The exception is referred to in my Special Report.

I directed the administration of the hospital as regards food supplies as follows. All supplies were brought by the tradespeople to the Health Department, and were then taken to the smallpox hospital by the Inspector of Nuisances (Mr. Whur) who had previously suffered from smallpox. In this way, many possible channels of the spread of infection were completely blocked. No visitors were permitted to enter the grounds of the hospital. Fortunately in every

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\* See Special Report.



instance the friends were open to reason, and no difficulty was raised. The staff headed by nurse Wilson deserves much commendation for the manner in which they endured their isolation at the hospital, and I sincerely thank them for the loyal manner in which they carried out my directions. When a fatal case occurred the burials were arranged for and carried out by Mr. Whur and other members of the Sanitary Staff in a manner which deserves special praise. All the officials of the Health department (with the exception of Mr. Whur who had smallpox a few years ago) were revaccinated by myself, and carried out all precautions as to disinfection, etc., as instructed by me.

Section 8 of the Vaccination Act of 1898, requires that a Register shall be kept of all patients treated in any smallpox hospital maintained by a Sanitary Authority.

The Register for Southend for 1902, was incorporated in my Special Report, a copy of which is appended. In October, 1902, the Local Government Board issued a circular showing the desirability of keeping records "which shall afford uniform and trustworthy statistics, and which shall be generally useful," and directed attention to a form of Register prepared by the Board's Medical Officer. The Health Committee agreed as to this desirability, and a Register and a supply of bed cards, prepared according to the directions of the Local Government Board, have been obtained for future use.

The total cost of hospital administration and other measures in connection with smallpox in the Borough during 1902, was £1,184 4s. 0d. Of this sum £600 7s. 2d. was expended in providing an additional block for eight beds and some out-buildings, which leaves a balance of £583 16s. 10d. for all working expenses, including removal of patients, disinfection, compensation, food for nurses and patients, funeral arrangements, &c., &c. This is a moderate expenditure as compared for instance with London, where extra Hospital accommodation alone involved a 3d. rate.

## Proceedings under the Public Health Act, 1902.

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1902.

September 23rd. Proceedings against ALFRED HEDGES for provision of receptacle for refuse and water supply. Fined 5/- and 4/- costs.

"	"	"	SIDNEY ADAMS } Manure pit in each case to SIDNEY ADAMS } be provided and nuisance to be abated. Fined £1 and 4/- costs in each case.
"	"	"	

September 30th }	"	"	WM. HARRIS, defective waste pipe, 59, Hart- ington Road, defendant to pay costs.
October 7th }	"	"	

November 18th }	"	"	W. BUTT, <i>re</i> overflowing of Cesspool in Beach Avenue. Cesspool to be emptied, defendant fined £3, 4/- costs and £2 2s. solicitor's fee.
December 16th }	"	"	

November 29th.	"	"	R. W. PIPER } Hutley's cottage to be closed, R. W. PIPER } defendant to pay costs.

11 Sanitary Certificates granted during 1902.

174 Burials in the Corporation's Borough Cemetery during 1902.

## Summary of Improvements for the Year 1902.

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- Full working of Public Health Laboratory.
- Filling in ditch rear of Hartington Road.
- Completion of Southchurch Beach Road Sewage Scheme.
- Drainage of Prittlewell.
- Provision of Meteorological Instruments.
- New Small Pox Hospital providing eight additional beds.
- New Block at Sanatorium providing twelve additional beds.
- Erection of brick wall round the additional two acres at the Sanatorium.
- Erection of Artisan Dwellings.
- Printed circulars *re* prevention of Infectious Diseases.
- Printed circulars *re* prevention of Infantile Diseases.
- Printed circulars *re* prevention of Expectoration in Public Places.
- Provision of Spray Disinfector for room disinfection.
- Appointment of two temporary Inspectors for house to house inspection.

### IN PROGRESS AND UNDER CONSIDERATION.

- Drainage of Sea View Estate.
- Drainage of Westcliff Park Estate.
- Enlargement of Administrative Block at Sanatorium.
- Provision of Refuse Destructor.
- Provision of Prophylactic doses of Diphtheria Antitoxin, in special cases
- Provision of Public Slaughter Houses.
- Treatment of sewage prior to discharge into the sea.
- Certification of Bakehouses.
- Repair of defective street gullies.
- Provision of Public Conveniences at Prittlewell and Western Esplanade.
- Provision of new Fire Appliances at Sanatorium.



## Sanitary Inspection.

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In the following tables prepared by Mr. Whur, the Chief Inspector of Nuisances, the work carried out by the Inspectors is given so far as can be stated in tabular form.

In addition to what is stated in the tables, attention has been given to verbal complaints. 674 inspections were made in connection with notifications of infectious disease. 116 visits were paid to slaughter houses, 349 to bakehouses, 54 to cowsheds, 428 to dairies and milk shops, 94 to workshops, 367 to provision shops. No less than 185 visits were made in connection with gipsy encampments, 75 houses were redrained and 48 house drains tested, 75 soil pipes tested and 49 re-tested. 3,017 articles were disinfected.

For particulars of the large amount of work carried out by the Inspectors, see below.

In addition to the six samples of water taken by the Inspectors, 16 samples for analysis have been taken and examined by myself during 1902.

Slaughterhouses on Register	...	...	...	7
„ notices served to cleanse	...	...	...	1
Bakehouses on Register	...	...	...	30
„ added to Register	...	...	...	—
„ notices served to cleanse	...	...	...	6
Dairies on Register	...	...	...	31
„ removed from Register	...	...	...	4
„ notices served to cleanse	...	...	...	11
Applications for Registration :—				
Premises unsatisfactory on application	...	3	}	7
New dairy since provided	1	}		
Business discontinued	1			
Plans deposited for dairy	1			
Premises satisfactory on application	...	4	}	6
New brick built dairies erected	...	...		
Old building adapted	...	...		

Notices on occupiers of cowsheds	...	...	...	1
Cowsheds on Register	...	...	...	4
Inspection of districts with Medical Officer of Health			..	21
Complaints received	...	...	...	87
Frivolous complaints	...	...	...	9
Nuisances detected without complaint			...	361
Nuisances abated	...	...	...	436
„ „ without notice	...	..	...	76
Notices served	...	...	...	375
Houses affected by Notices	...	...		485
Houses inspected	...	...	..	1,458
Workshops inspected	...	...	...	94
Visits to Gipsy Encampments	...	...	...	185
„ Slaughterhouses	...	...	...	116
„ Butcher's Shops...	...	...	...	100
„ Bakehouses	...	...	...	349
„ Dairies and Milkshops	...	...	...	428
„ Cowsheds	...	...	...	54
„ Fruit Shops	...	...	...	219
„ Fish Shops	...	..	...	57
„ Refreshment Houses	...	...	...	91
Refreshment Houses, kitchens cleansed		...	...	1
Food condemned :—21-lbs. Pork				
26-lbs. Plums				
56-lbs. Apples				
7-lbs. Ham				
2 Kidneys				
3 Herrings				
As to testing of House Drains :—				
Number of Houses tested	...	...	...	48
„ „ redrained	...	...	...	75
Total length of drains relaid and tested with water			...	6,279 ft
Visits during testing and retesting		...	...	3,431
Soil pipes tested and retested	...	...	...	124
Number of Sanitary Certificates applied for and granted				11
Miscellaneous :—				
Yards either paved or repaved	...	...	...	30
Ash bins provided	..	...	...	43
Wood sinks replaced with earthenware		...	...	13
Stables paved and drained	...	...	...	6
Manure pits rebuilt	...	...	...	6
Blocked drains cleared on notice		...	...	48
„ „ by Health Department			...	2
Cesspools, visits to	...	...	...	105
Inspections of Public Urinals	...	...	...	84
Public Urinals cleansed	...	...	...	11

No. of Houses discharging on beach, connected to sewer	19
„ „ draining into cesspools connected to sewer	11
New closet basins fixed, Ordinary ... ..	25
„ „ Pedestals .. ..	22
Cesspools cleaned and filled in ... ..	7
Privies converted into W. C.'s ... ..	8
Water laid on from Company's Mains to old houses ...	4
Unventilated soil pipes ventilated ... ..	3
Container closets condemned ... ..	3
Sink waste pipes disconnected from drains... ..	1
Iron lip traps condemned ... ..	7
Inspections Marine store yards ... ..	12
Houses ventilated under floors ... ..	2
Overcrowding abated, cases ... ..	2
Houses, Backways made up ... ..	—
„ Roofs repaired ... ..	9
Smoke observations ... ..	35

## As to Water Supply :—

Wells sunk for an improved supply of water by the Water Works Co. .. ..	1
Wells closed ... ..	1
W.C.'s supplied with water, Flushing cisterns provided	13
Cisterns cleaned, repaired, &c. ... ..	19
Samples of water taken for analysis ... ..	22

## Borough Engineer's Department :—

Sewers relaid by Corporation ... ..	1,700 yds
„ „ Estate owners... ..	8,600 „
Combined drains relaid by Corporation ... ..	175 „
Number of houses for which certificates were applied for	749
„ „ „ „ granted ... ..	697
„ „ „ „ deferred... ..	52
„ „ in course of erection, 31st Dec., 1902	537
„ „ connected to public sewers ... ..	689
„ „ with cesspools ... ..	27
„ „ with earth closets ... ..	14

Work done in connection with and after removal of patients  
to Sanatorium :—

Number of houses disinfected (rooms) ... ..	578
„ articles removed from houses for disinfection	3,017
„ Enquiries for Medical Officer of Health ... ..	153
„ Enquiries and visits to Small Pox Contacts...	86
„ Visits to Barge J.C. <i>re</i> S.P. Contacts ... ..	4
„ Patients removed to S. P. H. ... ..	25
„ „ „ Sanatorium ... ..	232
„ Visits to S. P. H. ... ..	139



## Miscellaneous :—

Enquiries Infantile deaths	...	...	...	34
Inspections <i>re</i> Infectious diseases	...	...	...	674
Enquiries <i>re</i> school absentees	...	...	...	95
Filthy houses cleansed, sec. 46, P.H.A., 1875	...	...	...	2
„ rooms „	...	...	...	2
Dwellings placed in habitable repair	...	...	...	4
„ closed	...	...	...	3
Notices <i>re</i> Removal of Manure, sec. 49, P.H.A., 1875	...	...	...	45
Manure removed and charged on owners (loads)	...	...	...	2 lds
Schools disinfected	...	...	...	6
Schools Inspections	...	..	...	22
Animals improperly kept, removed	...	...	...	39

## Particulars of Goods disinfected :—

Shawls	...	...	23	Milk Pails	...	...	1
Overlays	...	...	5	Cot Beds	...	...	17
Skirts	...	...	53	Cushions	...	...	41
Aprons	...	...	29	Night dresses	...	...	45
Petticoats	...	...	10	Shirts	...	...	48
Bed Vallances	...	...	48	Knickers	...	...	19 prs
Bedchair Cushions	...	...	25	Trousers	..	...	42 prs
Dresses	..	...	47	Waistcoats	...	...	27
Shoes	...	...	7prs	Overcoats	...	...	32
Pillows	...	...	316	Jackets	...	...	36
Blankets	...	...	298	Handkerchiefs	...	...	52
Beds	...	...	292	Vests	...	...	31
Counterpanes	...	...	195	Pants	...	...	10 prs
Sheets	...	...	98	Braces	...	...	1 pr
Bolsters	...	...	147	Stockings	...	...	49 prs
Mattresses	...	..	119	Rugs	...	...	34
Pillow Cases	..	...	17	Pieces of Carpet	...	...	134
Towels	...	...	64	Dressing Gowns	...	...	12
Fronts	...	...	1	Bodices	...	...	64
Sweaters	...	...	2	Table Covers	...	...	27
Capes	...	...	10	Stays	...	...	15 prs
Robes	...	...	1	Mats	...	...	42
Toilet Covers	...	...	56	Belts	...	...	5
Curtains	...	...	30	Slippers	...	...	12 prs
Cuffs	...	...	2prs	Collars	...	...	5
Pieces of Linen	...	...	85	Caps	...	...	17
Iron Boilers	...	...	2	Blinds	...	...	24
„ Saucepans	...	...	6	Bed Covers	...	...	12
Coffee Pots	...	...	1	Ties	...	...	5
Kettles	...	...	1	Chemise	...	...	3
Dishes	...	...	2	Pyjamas	...	...	2
Goods Disinfected	...	...	...	Total	3,017		

## Rainfall Register.

Rainfall in 1902.

Month.			Total Depth.	Greatest fall in 24 hours.		Number of days on which .01 or more fell.
			Inches	Depth	Date	
January	...	...	·54	·13	1st & 26th	7
February	...	...	1·72	·56	27th	12
March	...	...	1 20	·40	14th	10
April ...	...	...	·27	·06	5th	8
May ...	...	...	2·72	·38	29th	24
June ...	...	...	2·66	·61	13th	14
July ...	...	...	1·12	·27	9th	9
August	...	..	2 58	·60	18th	13
September	...	...	1·30	·55	2nd	8
October	...	...	1·72	·35	15th	17
November	...	...	1·53	·50	30th	11
December	...	...	1·15	·45	17th	11
Total	...	...	18·51			134

			Number of days on which rain fell.	Amount collected in inches.
Average for twelve years, 1891-1902			... 137	19·80
1901	...	...	... 107	14·83
1902	...	...	... 134	18·51

For the Monthly Rainfall Register I am indebted to the courtesy of Mr. Bilham.

TABLE I.  
Vital Statistics of Whole District during 1902 and  
Previous Years.

YEAR.	Popula- tion estimated to Middle of each Year.	BIRTHS.		TOTAL DEATHS REGISTERED IN THE DISTRICT.				Total Deaths in Public Institutions in the District.	Deaths of Non-residents registered in Public Institu- tions in the District.	Deaths of Residents regis- tered in Public Institutions beyond the District.	NETT DEATHS AT ALL AGES BELONGING TO THE DISTRICT.	
		Num- ber.	Rate.*	Under 1 Year of Age.		At all Ages.					Num- ber.	Rate*.
				Num- ber.	Rate per 1,000 Births registered	Num- ber.	Rate.*					
1	2	3	4	5	6	7	8	9	10	11	12	13
1892	13,174	351	26·64	50	142·4	256	19·44	...	...	...	....	...
1893	13,603	392	28·81	45	114·79	197	14·48	23	12	6	181	14·04
1894	15,407	365	23·69	51	139·61	204	13·24	18	14	6	196	12·72
†1895	16,203	426	26·29	49	115·02	263	16·2	21	26	5	242	14·93
†1896	17,529	474	27·04	74	147·67	295	16·8	20	25	6	276	15·74
†1897	19,302	553	28·65	88	159·15	262	15·12	21	24	8	246	12·81
†1898	22,583	603	26·70	103	170·81	350	15·49	34	39	18	329	14·56
†1899	24,710	657	26·58	121	184·17	400	16·1	23	29	13	384	15·54
†1900	27,721	739	26·62	135	182·40	416	14·64	34	37	21	400	14·44
1901	29,479	781	26·47	140	179·25	507	17·19	55	28	23	502	17·32
Aver- ages for years 1892- 1901.	19,971	535	27·06	85	153·44	315	15·77	27	26	11	307	14·93
1902	31,892	839	26·30	84	100·11	439	13·76	53	22	29	446	13·98

\* Rates in Columns 4, 8 and 13 calculated per 1,000 of estimated population.

†N.B.—During the years 1895-1900 the deaths of *all* Visitors were excluded, whether dying in public institutions or not; consequently the totals in column 10 exceeded those in column 9, and the nett death rates for these years would be rather higher than they are stated if calculated as provided for in this table. In 1901 and 1902 the deaths only of non-residents who died in public institutions are excluded.

I.	II.	III.
Institutions within the District receiving sick and infirm persons from outside the District.	Institutions outside the District receiving sick and infirm person from the District.	Other Institutions, the deaths in which have been distributed among the several localities in the District.
The Glen, St. John's Elmsville, All Saints St. Mary's Convent, St. Albans Nazareth House, All Saints	Rochford Union Workhouse	Borough Sanatorium Victoria Hospital.

Area of District in Acres }  
(Exclusive of area covered } 5,172  
by Water).

Total Population at all ages 28,857 }  
No. of Inhabited Houses ... 5,417 } At  
Average No. of Persons per house 5·3 } Census  
of 1901



TABLE III. Cases of Infectious Disease notified during the Year 1902.

NOTIFIABLE DISEASE.	CASES NOTIFIED IN WHOLE DISTRICT							TOTAL CASES NOTIFIED IN EACH LOCALITY.					NO. OF CASES REMOVED TO HOSPITAL FROM EACH LOCALITY.				
	At all Ages.	Un-der 1.	1 to 5	5 to 15.	15 to 25.	25 to 65.	65 and upwards	1	2	3	4	5	1	2	3	4	5
	St. John's	St. Mary's	St. Al-bans	All Saints	South-church	St. John's	St. Mary's	St. Al-bans	All Saints	South-church	St. John's	St. Mary's (S-P-H)	St. Al-bans (H)	All Saints	South-church	St. John's	St. Mary's (S-P-H)
*Small-pox ...	24	1	2	4	4	13	...	14	2	2	6	0	14	2	2	6	0
Cholera ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
†Diphtheria...	171	...	59	94	8	10	...	73	10	11	48	29	43	5	5	33	27
Membranous croup	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erysipelas ...	35	2	...	2	6	20	5	15	8	6	5	1	...	...	...	...	...
‡Scarlet Fever	109	...	19	76	10	4	...	47	10	19	28	5	40	5	14	26	2
Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
§Enteric Fever	105	...	5	29	35	36	...	37	14	27	17	10	20	9	17	14	6
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Continued Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Fever	2	...	...	...	...	2	...	...	1	1	...	...	...	...	...	...	...
Plague ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chicken-pox	209	13	70	119	5	2	...	49	19	77	31	33	...	...	...	...	...
Totals	655	16	155	324	68	87	5	235	64	143	135	78	117	21	38	79	35

\* Three of these were originally notified as Chicken-pox. In addition another notification was withdrawn.  
† In addition 9 notifications were withdrawn. ‡ In addition one case was twice notified.  
§ In addition one case was twice notified and two other notifications withdrawn.  
|| In addition 4 notifications were withdrawn, 3 being re-notified as Small-pox.

TABLE IV.

Causes of, and Ages at, Death during Year 1902.

CAUSES OF DEATH.	DEATHS IN OR BELONGING TO WHOLE DISTRICT AT SUBJOINED AGES.							DEATHS IN OR BELONGING TO LOCALITIES. (AT ALL AGES).					Total Deaths in Public Institutions in the District
	All Ages.	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.	PRITTEWELL.				South-church.	
								St. Johns.	St. Mary's.	St. Albans.	All Saints.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Small-pox ...	5	...	1	1	1	2	..	2	...	..	3	..	5
Measles ...	2	...	2	..	..	...	...	..	...	...	...	2	...
Scarlet Fever ...	1	...	...	...	1	...	...	...	...	1	...	...	1
Whooping Cough ...	8	5	3	...	...	...	...	2	3	3	...	...	...
Diphtheria and Membranous Croup ...	25	...	15	10	...	...	...	9	1	...	10	5	11
Croup ...	1	...	...	1	..	..	..	...	...	...	...	1	...
Fever { Typhus ... Enteric ... Other continued ...	...	...	...	...	...	...	...	...	...	..	...	...	...
	12	...	...	1	3	8	...	4	3	4	1	...	7
	...	...	...	...	...	...	...	..	...	...	..	...	...
Epidemic Influenza ..	8	1	..	...	...	5	2	1	3	3	1	...	...
Cholera ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Plague ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diarrhoea ...	8	5	3	...	...	...	...	3	...	1	3	1	...
Enteritis ...	8	6	1	..	..	1	..	2	..	...	4	2	...







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